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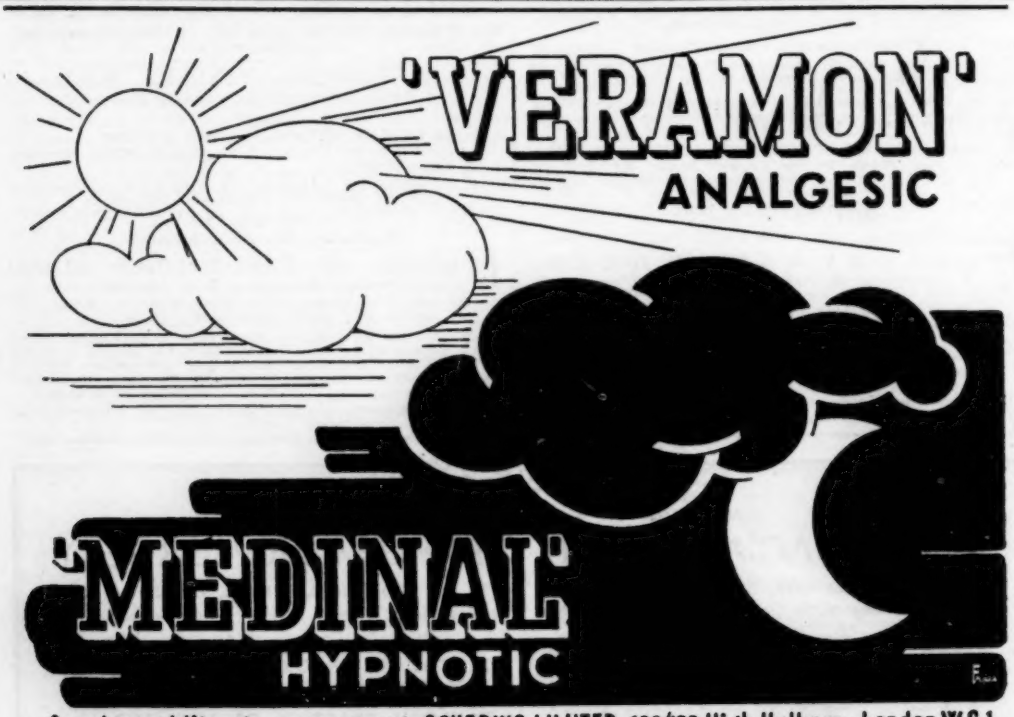

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Introduction

(LORD DAWSON)

IT is only natural to suppose that a muscle which is unceasingly active from its birth to its death and which shows a large and quickly varying range in its output of energy must have provision for a large blood-supply and be sensitive to deficiencies thereof.

In fact, the healthy heart muscle *has* this capacious blood-supply, for it is calculated that during exercise the flow of blood through the coronary arteries per minute is 1·4 litres, which is over three times the volume of the heart. Again, if there is a 50 per cent. fall in oxygen saturation of arterial blood, the coronary flow may in compensation increase fourfold.

An organ so abundantly active, if it is to preserve its function and healthy structure, must be secured adequate nourishment. Absence of that nourishment will produce similar areas of degeneration in the myocardium, whether narrowed arterial channels make quantity of blood inadequate, or inadequacy of oxygen-content makes the quality of blood defective. Thus Büchner reduced the oxygen-carrying capacity of the blood in rabbits by bleeding or by inducing a state of carbon monoxide poisoning. At the autopsies multiple areas of necrosis were scattered throughout the myocardium, a finding resembling that present after coronary obstruction in man. Or again, when Kountz and Hamouda perfused the isolated dog's heart with venous blood, the resulting oxygen starvation gave electrocardiographic tracings from that heart resembling those of coronary occlusion.

Turning to the evidence of clinical records, Büchner, Weber, and Haager have published 43 fatal cases of cardiac ischæmia. These comprise failure of blood-supply by (1) coronary thrombosis in an apparently normal coronary tree, (2) thrombosis complicating atheroma of the coronary arteries, (3) rigidity and narrowing of the arteries of the coronary tree without gross obstruction, and (4) syphilitic aortitis when only the orifices of the coronary arteries were affected. In all these cases there were alike the characteristic electrocardiogram, and at autopsy the characteristic pathological changes in the myocardium—viz., with obstruction of a main coronary artery there was an old or recent infarct while with no actual block but a general narrowing of the arterial channels there were scattered areas of recent necrosis or old fibrosis.

In cases therefore where occlusion is not immediately destructive of life, the problem is to secure an adequate compensatory circulation to the myocardium. The difficulty is not that the anastomoses are incapable of development, but rather that the vascular needs of the myocardium are so great.

Spalteholz has demonstrated a rich anastomosis between the right and left coronary trees and between the branches of the same artery, but the effectiveness of these and the capillary beds they feed would be impaired in some cases of arterio-sclerosis. There are further anastomoses between the coronary tree and the vasa vasorum of the aorta and pulmonary artery, but how far this network of collateral vessels is effective in surviving cases of coronary occlusion is not known. On the other hand, it is known that pericardial adhesions can form an effective collateral circulation. But the existence of such adhesions in a case of coronary occlusion is a chance and uncommon happening. Thus in Parkinson and Bedford's 83 autopsies on cases of coronary occlusion there were 11 cases of pericarditis.

The vascular effectiveness of such adhesions is demonstrated by a striking case published by Thorel. The patient died of carcinoma, and the post-mortem showed an old adhesive pericarditis side by side with a complete and long-standing obliteration of the main stems of both left and right coronary arteries. There had been no history of cardiac distress during life. For a long period the myocardium must have had its supply from this collateral circulation.

Moritz by injection studies has been able to establish the existence of vascular connexion, through these adhesions, between the pericardium and coronary tree.

It follows therefore that in a considerable coronary occlusion collateral circulation must eventuate if the myocardium is to be saved. Such a compensatory circulation can form of itself: where it does not do so, the use of surgical means to establish it is essentially reasonable and its prospect should be good in carefully selected cases provided the capillary bed itself is not too degenerate to profit by a renewed arterial supply.

Experimental Relief of Cardiac Ischæmia

VARIOUS ingenious methods have been used to produce ischæmia in the heart of the experimental animal. The most ingenious were perhaps those of Vogt (1904), who injected lycopodium seeds in a fluid suspension down the carotid artery with sufficient force to close the semilunar valves and drive the seeds into the coronary circuit. Ligature of various branches of the coronary artery is of course a much older experiment, and it has been found that, like man, the animal will usually survive occlusion of a main trunk, more especially ligature of the descending branch of the left coronary. True there remains an infarct and in the period of acute ischæmia the heart is very sensitive, so that some chance stimulation may produce a fatal fibrillation, but serious after-effects do not usually appear. Ligature of the right coronary artery is a rather more severe operation and ligature of the left coronary before it has given off its circumflex branch is fatal.

Leriche and Fontaine have lately made important contributions to the experimental study of coronary occlusion. They found that the perivascular nervous plexus of the coronary vessels played a significant

* A special lecture, introduced by Lord Dawson, delivered before the Royal College of Surgeons of England on Jan. 15th, 1937. Lord Dawson spoke as head of the cardiovascular clinic at Lambeth Hospital, where the clinical work described by Mr. O'Shaughnessy is being done.

part in the reaction of the mammalian heart to coronary ligature. A preliminary injection of the perivascular plexus diminished the risk of ventricular fibrillation and enabled the animal to maintain a blood pressure adequate for the best use of the normal collateral channels. Further, they claimed that excision of the neighbouring ganglia favoured the formation of a good collateral supply, as they had shown to be the case in experimental occlusion of the vessels of the lower limb. It is true that there is an important school who would attribute all coronary vasoconstrictor effects to the vagus and not to the sympathetic. The exact experiments of Rein, using his "stromuhr" and making his observations on the intact animal, seemed indeed to demonstrate this point quite clearly; but in the present uncertainty as to the exact morphology of the autonomic nervous system this is only typical of the inconsistencies with which the literature of the system abounds.

Leriche and Fontaine were also attracted to the possibilities of operation on cardiac aneurysm and for this purpose employed a free graft of the pectoralis muscle (1932).

In 1935 Beck and Tichy published the results of some animal experiments in which various grafts fashioned from the fibrous pericardium, muscles of the chest wall and omentum were applied to the surface of the heart, after preliminary destruction of the epicardial endothelium. The method and results of these experiments were not recorded, but they described some other experiments in which a large area of epicardium was removed so that massive adhesions formed between the heart and the parietal pericardium: these animals were able to withstand almost complete occlusion of both main coronary trunks, which was effected by means of silver bands.

My own experiments on cardiac grafting were proceeding at the same time as the work recorded by Beck, the first omental graft being performed at Downe in the spring of 1933; but while Beck was stimulated by Moritz's work on vascularisation of pericardial adhesions, my own experiments had their origin in some earlier work on resection of the thoracic œsophagus, when the valuable properties of a pedicled omental graft first became apparent to me. I had also been encouraged to repeat some of the Leriche experiments on ligature of the coronary artery using control of the nervous factor, and I was aware of the earlier observations of Klose (1922), who had noted the capacity of free grafts of omentum to replace excised portions of parietal pericardium.

In a previous paper (1936) I have described the first results of a series of omental grafts in the cat and the greyhound. These demonstrated that the presence of such a graft is compatible with the highest degree of physical exertion. Greyhounds which had suffered ligature of the descending branch of the left coronary artery chased the electric hare round a full course (525 yards) without distress after the operation of cardio-omentopexy.

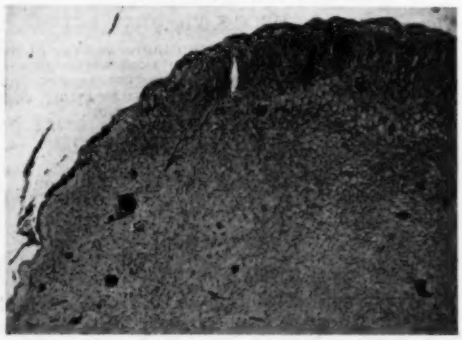

FIG. 2.—Section of myocardium of cat, showing pigment injected through an omental graft. (× 50.)

To demonstrate the existence of vascular connexions between the graft and the heart of the animal, the organ was removed from the chest by severing all the great vessels and was suspended to a retort-stand, leaving the graft as its sole connexion to the animal. The abdominal aorta was cannulated and the injection fluid (in most cases a watery suspension of Indian ink but in others a coarse injection medium composed of starch, carmine, and gelatin) was delivered at a pressure of 120 mm. of Hg. In these conditions the fluid was seen to fill the coronary tree until it appeared in the cavity of the heart and dripped out from the cut ends of the aorta and pulmonary artery (Fig. 1). The injected material was visible to the naked eye, and in microscopical sections could be demonstrated lying in the deeper branches of the coronary artery even under the endocardium (Fig. 2).

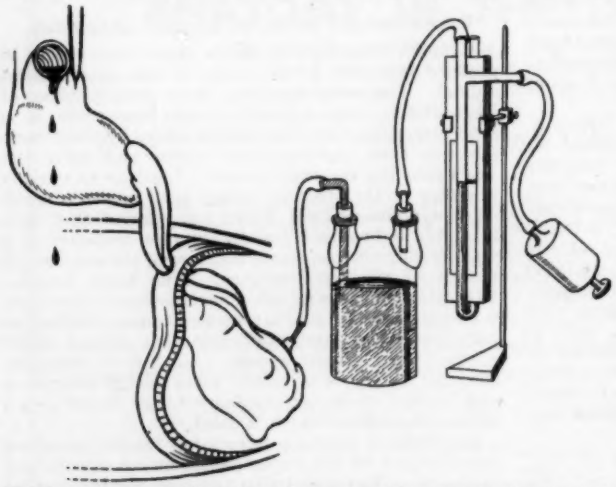

FIG. 1.—Injection of blood through an omental graft into the heart, to demonstrate the vascular connexion.

It is important to emphasise that vascularisation occurred whether the graft was applied to a normal heart, to a recent infarct, or to an old infarct, for these are the three possible choices with which one might be presented when operating for the relief of cardiac ischæmia in man. It must also be stressed (in view of one recent criticism) that when the graft was applied to an infarct general connexions were established through the infarcted area with the remainder of the coronary tree. The graft was always so applied to the apex of the heart as to overlap the territories supplied by the right and by the left coronary arteries.

During the past year further experimental evidence of the vascularising power of the cardio-omental graft has

accumulated, and some of the more important findings will now be summarised.

1. *Histological evidence without the use of injection.*—On examining the heart a week after application of the graft a very large primitive vessel could be seen growing into the myocardium (Fig. 3).

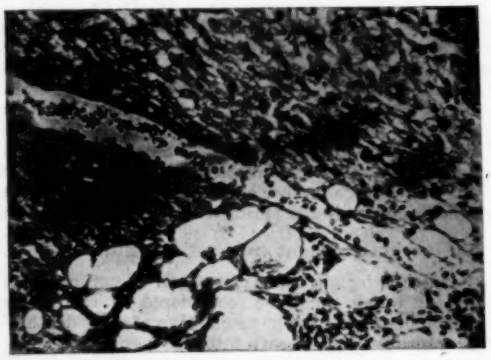

FIG. 3.—Section through junction between myocardium (above) and omentum (below) a week after operation. A large primitive vessel is growing from the omentum into the heart muscle. (× 120.)

2. *Biological evidence of the protective function of the omentum.*—In an experiment performed by Mr. George Mason (details of which will be published later) a diaphragmatic graft was applied to the surface of the heart after ligature of some branches of the coronary vessels. The animal was killed some months afterwards, and it was then discovered that the omentum had made its way through a small defect left at the base of the diaphragmatic flap and had firmly attached itself to the ischæmic area in the wall of the heart.

3. *A long-term experiment.*—On Dec. 8th, 1936, there was killed a greyhound which had been subjected to ligature of the descending branch of the left coronary artery on March 21st, 1935. He had a cardio-omentopexy on May 28th, 1935, and on Sept. 12th, 1935, there is the note: "Exercise tolerance tested on track. Running capacity normal, run finished in very good order." The appearance of the heart is shown in Fig. 4. There was an extraordinary vascularity of the mediastinum, and there were numerous vascular connexions between the graft and the anterior mediastinum. Anastomoses could also be seen between the vessels of the diaphragm and the base of the graft. The heart was then removed from the chest and an injection carried out in the usual way, using a barium emulsion. Complete filling of the coronary tree was obtained, and on the radiogram the injected trunk of the left coronary artery could be seen.

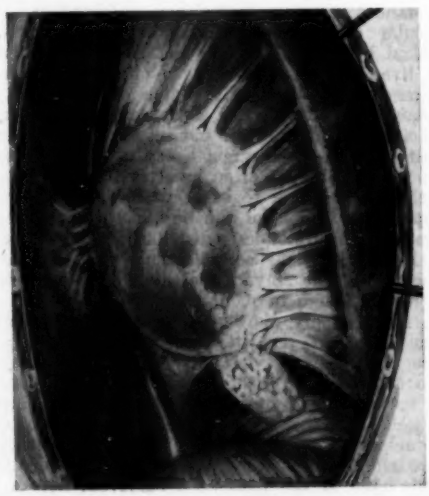

FIG. 4.—Dissection of thorax of a greyhound eighteen months after cardio-omentopexy, showing vascularity of mediastinum and vascular connexions between graft and mediastinum.

* * * *

The omentum is the only structure in the body with the specific property of vascularisation, and many years ago Rutherford Morison recognised the practical importance of this fact. "The only uterine fibroids which can attain to colossal size are either retroperitoneal or depend chiefly upon vessels derived from the omentum for their continued growth. The largest I ever removed was of the subperitoneal variety. It had a thin and narrow pedicle below, but above was capped by omentum which carried to it at least half a dozen arteries of the size of the brachial."

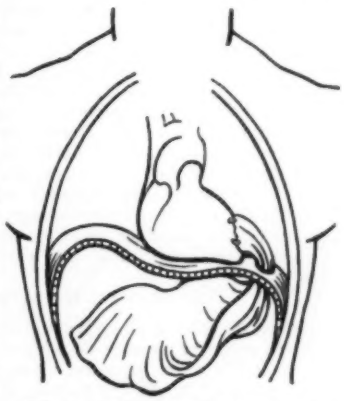

FIG. 5.—Diagram illustrating cardio-omentopexy in man.

In its inventor's hands and in those of his immediate successors omentopexy proved a useful operation for selected cases of cirrhosis of the liver. Prof. Grey Turner is still in touch with a patient who has remained well since his operation in 1906. Personal experience of it in the Sudan confirmed my belief in its value, provided Morison's exact technique was followed and the choice of case was correct. More recently the therapeutic value of omentopexy in cirrhosis has been questioned, but all authorities are agreed as to the remarkable vascularising powers of the organ; even Hughson, who condemns it as treatment for cirrhosis, agrees on this point and quotes the Mayos and other surgeons of experience to the same effect. Thus even if it is conceded that omentopexy cannot cure cirrhosis of the liver—a condition whose ætiology and pathology remain, after all, to a large extent obscure—the essential theoretical basis of cardio-omentopexy (Fig. 5) remains unshaken. Apart altogether from the clinical experiences of Rutherford Morison, Sir David Wilkie's early and complete experiments on the omentum gave an initial impetus to its use in the surgery of the chest. Wilkie showed how in the cat the omentum could avert the disaster which normally follows ligature of all the vessels to the spleen, and there seemed no reason why, if the omentum could compensate for acute ischæmia in its natural milieu,

it should not fulfil a similar function once it gained access to the thoracic cavity.

Cardio-omentopexy in Man

The school of thoracic surgery to which I belong has always held that major operations on the chest are only justifiable, and only successful, when there is full collaboration between physician and surgeon. It is not enough for the physician to refer a case; he must be in close contact with the patient just before the operation and must indeed help to select the time for it, and he and the surgeon must share the conduct of the post-operative treatment. The recent development of radiological and other special methods of examination have done nothing to invalidate this principle, and it is of course of special importance before operation is performed on the human heart. I should like to emphasise that although the operation of cardio-omentopexy was devised in a surgical laboratory and its technique has been modified according to purely surgical contingencies, I have performed it only after careful consultations with the medical staff of the Lambeth Cardiovascular Clinic (Lord Dawson of Penn, Dr. Daniel T. Davies, and Dr. H. E. Mansell). In addition the suitability of each patient for general anæsthesia has been assessed by Dr. J. K. Hasler, whose advice and assistance have been available at each operation. The elimination of post-operative shock has been made possible by experimental work done in the laboratories of the Royal College of Surgeons, but the successful conduct of the ten days following operation has depended on unremitting medical care.

ALTERNATIVE OPERATIONS

Before describing the way in which a graft may assist in recovery from cardiac ischæmia, it is perhaps necessary to refer to some alternative procedures. In all cases of cardiac ischæmia there is probably a vasospastic factor, and this is of special importance in diffuse atheroma of the tree—as is suggested by the beneficial effect of the nitrites in angina of this type. It therefore appears logical to attempt to influence this spasm by nerve section, and the evidence in favour of *sympathectomy* has been summarised by Leriche (1935).

In the past (1926–31) I have from time to time carried out sympathectomy, but more recently, when an intervention on the nervous side was indicated, I have used the Mandl technique of *paravertebral injection*. This operation proved most successful in the case of a man of 78, whom I discovered as a bed-ridden patient with frequent anginal attacks and who was afterwards able to resume a normal life of such activity as was compatible with his age. At the same time, he has continued to have attacks of faintness, and these attacks he describes as essentially similar to his old attacks, with, for him, the important difference that they are painless. Experience of this case finally freed me from the old bogy that it was wrong to remove the warning signal (the "red light" of Mackenzie) of pain in the angina of effort; the patient still receives the warning if he attempts too great exertion, but the removal of the pain has been in every way beneficial. This case also confirmed me in my belief that attempts to remove the nervous factor should be reserved for patients whose age or general condition precluded a direct attack on the ischæmic factor. It is established that fatal angina occurs only when there is definite and gross disease of the coronary tree, and it seems reasonable to assume that if a new blood-supply can be furnished the effect of spasm of the diseased vessels will lose its significance, and if, as now seems probable, the seat of the pain is the anoxæmic myocardium, pain should be abolished and cardiac efficiency maintained. So far as we can tell from our initial cases, the graft does seem to have this effect, although the possibility that in certain patients the nervous factor may also require control cannot yet be excluded.

Another indirect operation of extraordinary interest is *total thyroidectomy*, first performed for the relief of congestive heart failure by Cutler in 1932. Since then several series have been published both in America and in this country, and Levine states that the immediate mortality is between 5 and 10 per cent. Undoubtedly this operation has been an important contribution to cardiovascular surgery and it should encourage further efforts to influence incurable cardiovascular disease through the endocrine system.

DEATH FROM CARDIAC ISCHÆMIA

Cardiac ischæmia can cause death in various ways, some of which must be considered in relation to cardio-omentopexy. The mechanism of some deaths—e.g., rupture of the heart into the pericardial sac—is quite clear; that of others is less so.

Of special interest in a general way, although not of course immediately related to treatment by grafting, are those cases in which sudden death follows occlusion of some quite small branch of the coronary tree and is presumably caused by the operation of some nervous reflex. It seems probable that the mode of death is similar to that sometimes seen in pulmonary embolism when the embolus has been too small to have any significant effect on the mechanical efficiency of the pulmonary circulation. The shock associated with sudden occlusion of a larger vessel may also prove fatal, especially if morphia in adequate dosage is not given.

The mode of death in those comparatively rare cases of coronary thrombosis in which rupture of the infarct occurs soon after the occlusion is clear: either the immediate collateral supply has been inadequate or, more probably, an extension of the thrombotic process has limited access of collaterals to the ischæmic area. The course of other cases in which a state of permanent cardiac inefficiency follows an initial vascular catastrophe, whether the inefficiency be marked by swelling of the feet and enlargement of the liver, by recurrent attacks of acute respiratory distress, or by persistent angina of effort, may be explained on the basis of a myocardial blood-supply sufficient to maintain life but insufficient for normal cardiac function. The fact that the infarct following coronary thrombosis often involves the deeper layers of the myocardium together with the endocardium explains the source of the peripheral emboli, either pulmonary or systemic in distribution, which are one of the more serious complications of acute cardiac ischæmia. The myocardial failure of syphilitic aortitis, although frequently sudden in its fatal ending, is commonly marked by a period of recurrent angina of effort, and the mechanism of the gradual strangulation of the coronary supply at its source is in the main comprehensible. More mysterious are the factors which determine an eventual failure of the ischæmic heart in chronic hypertension, for often the attendant circumstances of a fatal attack of heart failure do not at first differ from those of attacks which have in the past been survived, nor do the gross or microscopic appearances of the heart at autopsy appear inconsistent with continued survival. Goldenberg and Rothberger have shown that the

perfusion coefficient is lowered in the hypertensive heart, and their work is a useful reminder that functional as well as morphological methods may be employed in the estimation of cardiac ischæmia.

FUNCTION OF THE GRAFT IN VARIOUS DISORDERS

(see Fig. 6)

The interest of the surgeon is of course specially directed towards *cardiac aneurysm*—one of the less common sequelæ of acute cardiac ischæmia—and this interest has naturally been more general since Sauerbruch's astonishing success with radical operation for the condition. Although aneurysm of the heart is rare—Huchard in the course of his career is said to have observed only three cases—its rarity must not be exaggerated, for in one year alone three cases came to autopsy in Lambeth Hospital and in 1934 Steel reported its intra-vitam diagnosis in six patients. An aneurysm of the heart is the clearest evidence that the heart has suffered a grave vascular catastrophe, and although adherence of the sac to the parietal pericardium may enable some years of useful life to be passed, life is eventually threatened, for a second vascular occlusion may either so limit the blood-supply of the remaining cardiac muscle as to render it inefficient or produce a local necrosis of the aneurysmal sac which then perforates. It is well to emphasise that while bodily activity may predispose to acute rupture of the heart after coronary thrombosis, perforation of an aneurysm of the heart is due to a second vascular occlusion and *not* to some additional strain. In the last case I observed the perforation occurred with the patient quite quietly resting in bed as she had done since her initial thrombosis some two months previously.

In this case the sac of the aneurysm had failed to adhere to the pericardium, and this was also the condition in another aneurysm I observed in which the patient died of progressive heart failure a few months after her initial thrombosis. The fate of these two patients is in striking contrast to the favourable immediate course when parietal adhesions give access to an additional collateral supply: the historical case of Sternberg (who coined the term pericarditis epistenocardica), the case of Fugiami, and the case reported by Koch and Kong may be cited.

The graft, as we have demonstrated on animals, operates in several ways. Not only is a new blood-supply brought into direct relationship with the ischæmic area and with the coronary tree, but the normal collaterals in the mediastinum are both reinforced and given access to the ischæmic heart. This second function of the graft appears more important in man than in the animal, for the vessels surrounding the pericardium seem in proportion larger. As an example of this I would instance the inferior sternopericardial ligament (shown in Fig. 9) which in the living patient appears as a much more important structure than studies in the cadaver would lead one to suppose. Many vessels ramify in the subpleural fat which covers this ligament, which is, of course, so placed as to provide an immediate collateral supply through the pericardium when a superficial infarct occurs at the site of election, which is on the anterior aspect of the organ in the region of the apex. At operation the graft is always arranged in such a way that adhesion with this ligament may develop. A third function of the graft, which Beck has recently emphasised, is its "bridge" action in supplementing the natural anastomosis between the right and left coronary arteries.

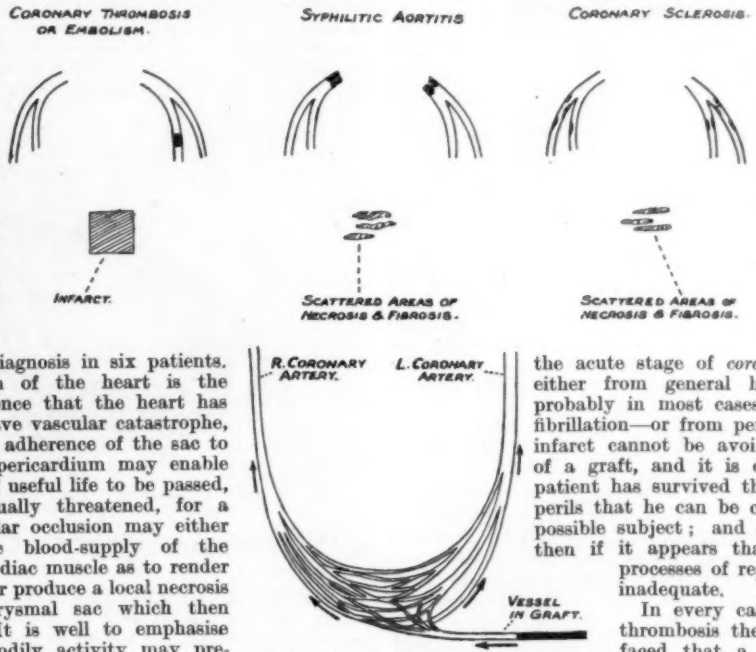

FIG. 6.—Diagram to show the function of the graft in coronary obstruction and coronary insufficiency.

It is obvious that deaths during the acute stage of *coronary occlusion* either from general heart failure—probably in most cases a ventricular fibrillation—or from perforation of an infarct cannot be avoided by means of a graft, and it is only when the patient has survived these immediate perils that he can be considered as a possible subject; and of course only then if it appears that the natural processes of repair have been inadequate.

In every case of coronary thrombosis the fact must be faced that a second attack is almost inevitable, and although under favourable conditions this may be postponed for years the exact time of its coming cannot be predicted. It is also clear that recovery from a second attack is only likely if natural repair and compensation for the first attack have been efficient, and the provision of an alternative blood-supply would be especially valuable when, after an attack of coronary thrombosis, natural compensation has been inadequate. Under these conditions the provision of an additional blood-supply would serve two purposes. In the first place, better nutrition of the still functioning myocardium might improve its performance, and in the second place, once the heart was in possession of an alternative supply the accident of a second vascular occlusion should be less likely to be fatal.

The factors governing the onset of *ventricular fibrillation* in a heart containing an old fibrosed infarct are most mysterious, and, as several authorities have pointed out, autopsy often reveals no mechanical cause for the fatality—indeed from the post-mortem appearances the accident might just as well have occurred months previously or not at all. It is possible that these circumstances might provide the

ideal indication for operation on the autonomic nervous system; at present the one certain factor is the ischæmia, and control of this factor might prevent deaths from ventricular fibrillation.

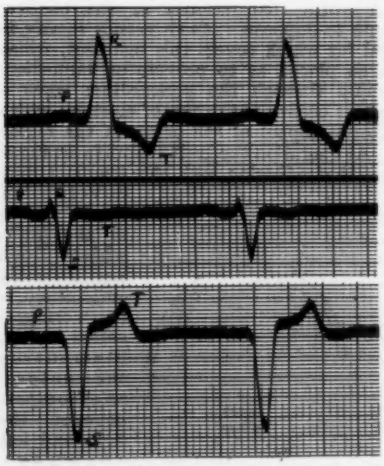

FIG. 7 (Case 5).—Electrocardiogram taken before operation, showing myocardial degeneration.

Mention has been made of the *embolic complications* of coronary thrombosis. These sometimes occur early in the illness and cannot be influenced by grafting, but as presumably the efficient organisation of the deeper layers of the infarct is the only protection against the detachment of emboli and this organisation in turn depends on the efficiency of the natural collateral channels, a graft might serve a useful function in some of the delayed cases.

In cardiac aneurysm the function of the graft would be to supplement the myocardial blood-supply sufficiently to make a second occlusion less serious, and anastomosis with the sac of the aneurysm should serve as a protection against perforation.

On theoretical grounds a graft might be of special service in the case of cardiac ischæmia resulting from an established *syphilitic aortitis*, for here, as has been already mentioned, all the natural processes of

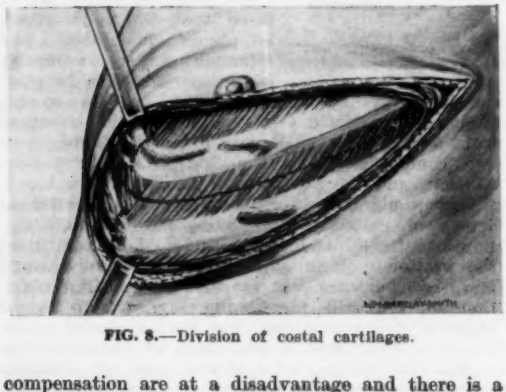

FIG. 8.—Division of costal cartilages.

compensation are at a disadvantage and there is a normal peripheral tree into which the new blood-supply can be fed.

The provision of an additional blood-supply to a heart with *diffuse atheroma of the coronary tree* but no gross obstruction has attractive possibilities. It has been demonstrated by Büchner in several fatal cases of hypertensive heart failure that an electrocardiogram characteristic of ischæmia was associated with diffuse areas of necrosis in the heart after death, and for such patients an additional blood-supply should be beneficial.

INDICATIONS

It will be seen that the indications for cardiomentopexy are not yet rigidly defined. They will be more fully described in a future paper by the medical staff of the Lambeth Cardiovascular Clinic, and here only a provisional outline will be given. We have been guided in each individual case by two considerations. In the first place we have demanded unequivocal evidence of cardiac ischæmia, and we have then proceeded to an intervention only when we have been satisfied that its immediate risks were less than the patient must in any event run if his disease pursued its natural course. These points may be illustrated by reference to some of the patients submitted to operation. In Case 1, for example, the patient had had a coronary thrombosis a year

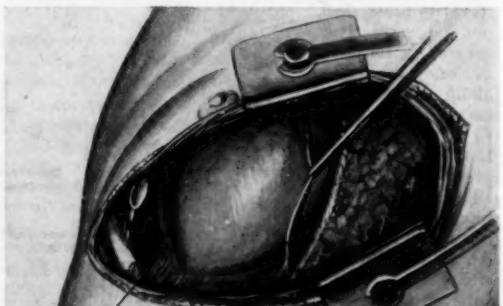

FIG. 9.—Exposure of pericardium and crushing of phrenic nerve.

previously and he was left with such serious angina of effort that he had to stay in hospital. It seemed clear that the effect of a second occlusion would prove very serious and probably fatal. In Case 3 the patient, who had hypertension, suffered a coronary thrombosis, and in spite of rest and medical measures was eventually left with pulsus alternans, a gallop rhythm, and inability to rest lying down. It was unlikely that she would react favourably to another vascular crisis and her cardiac blood-supply was therefore augmented by surgical means. In Case 5 we had evidence on the electrocardiogram of gross myocardial degeneration (Fig. 7); the patient had been bedridden for over a year and angina appeared on the slightest exertion. Here too it seemed that further occlusion of the coronary tree would have serious consequences, which might be alleviated by a graft, and while it seemed unlikely that the well-established pathological changes in the conduction system could be modified it seemed worth improving the nutrition of her still functioning myocardium.

TECHNIQUE

After suitable premedication, general anæsthesia is induced and maintained with the Tiegel-Henle apparatus, which supplies oxygen under positive pressure together with vaporised ether. With the patient on his back, the chest is entered through an incision along the fifth intercostal space which

extends from the midline to the anterior axillary line. The fifth and sixth costal cartilages are divided near the sternum after the manner of Kirschner (Fig. 8), and by the use of a large Sauerbruch intercostal retractor the pericardium is exposed (Fig. 9). The phrenic nerve is identified and crushed with a hæmostat, and once this has been done the pressure in the anæsthetic apparatus is reduced (from 10 to

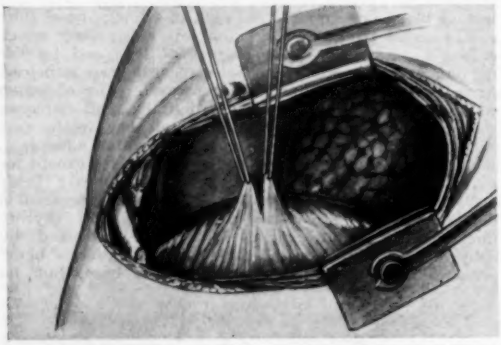

FIG. 10.—Incision through diaphragm.

6 cm. of water) and the table is tilted to the right. As a result of these manœuvres the left leaf of the diaphragm appears in the operation field, and after the insertion of two sutures the muscle is incised (Fig. 10). The abdomen is then explored through the diaphragmatic incision; a suitable portion of the omentum is obtained and brought through into the chest. The wound in the diaphragm is then closed by suture (Fig. 11). The table is brought back to its original position, the degree of inflation of the lung is again increased, and the heart, covered by the pericardium, is once more in view. With caution the pericardium is incised (Fig. 12) and the graft is attached to the surface of the heart and to the edges of the pericardium by suture with fine linen thread (Fig. 13). Finally the chest wound is closed in layers in the usual way (Fig. 14). The appearance of the healed incision is illustrated in Fig. 15 (Case 4).

CASE HISTORIES

CASE 1.—A man, aged 64, was suffering from angina pectoris dating from an acute illness diagnosed as coronary thrombosis for which he had been treated in a voluntary hospital. Dr. G. W. Pickering kindly saw the patient and confirmed the diagnosis of angina of effort. On Jan. 4th, 1936, at Lewisham Hospital cardio-omentopexy was performed with the assistance of Dr. Humphrey Nockolds and Mr. A. Simpson Smith, under general anæsthesia given by Dr. Hasler. There was no post-operative shock; an hour after operation the blood pressure was 130, the pulse-rate 84, the respirations 24, and the temperature normal. No special cause for anxiety arose until Jan. 10th, when there was a severe melæna with collapse. Transfusion was contemplated but not carried out, and a second severe hæmorrhage on Jan. 12th proved rapidly fatal. At autopsy the source of the hæmorrhage was found to be a large chronic duodenal ulcer; the colon and other abdominal viscera were normal. All was in order in the operation area, and there was evidence of cardiac ischæmia, especially of the right heart.

CASE 2.—A man, aged 65, a cosmopolitan of varying occupations. Angina pectoris for four years, nine attacks in all. Last attack on July 6th, 1936, lasted four hours, and was not relieved by amyl nitrite. Admitted on the following day to St. Stephen's Hospital (L.C.C.), and transferred to the clinic on July 28th. He was a heavy smoker until three years ago. He gave a history of malaria and three laparotomies—for appendicitis, adhesions, and gastro-enterostomy. A paternal uncle had dropped dead of angina. Examination: slight tortuosity of radial artery; heart normal clinically but enlarged radiographically; B.P. (blood pressure) 116/72; blood-urea 32 mg. per 100 c.cm.; Wassermann reaction negative. Electrocardiogram showed ST interval raised in leads II and III.

Cardio-omentopexy was performed at Lambeth Hospital on August 17th, 1936, with the assistance of Mr. F. Watson and Dr. P. Berry under general anæsthesia given by Dr. Hasler. No difficulty in obtaining omentum in spite of previous laparotomies. Pulse-rate at the end of operation 96. Recovery was uneventful except for an immediate mild bronchitis. He was kept in bed for 4 weeks, and took his discharge on Dec. 11th, 16½ weeks after operation, free of symptoms except slight breathlessness on exertion. He had no more attacks of angina, his pulse improved in volume, his blood pressure rose gradually to 160/90, and there were progressive changes in the electrocardiogram. Slight movement of the left diaphragm were observed on the screen for first time 14 weeks after operation.

CASE 3.—A man, aged 71, retired from Burma police. Angina pectoris for 2–3 years. Attacks now almost daily, related to exertion, emotion, or nightmare, and relieved by tablets of nitroglycerin. He was referred to the clinic by Dr. Dean Pollard of Bedford, and was admitted on July 27th, 1936. Examination: oral sepsis; radial arterio-sclerosis; heart enlarged clinically and radiographically; B.P. 205/105; blood-urea 44 mg. per 100 c.cm.; Wassermann reaction negative; electrocardiogram showed left ventricular preponderance, T wave negative in lead I, and ST interval depressed in lead I and raised in lead III.

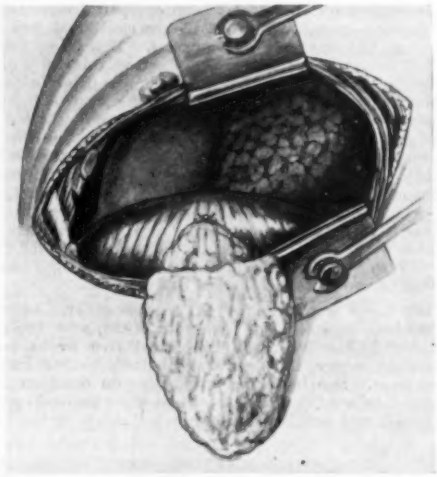

FIG. 11.—The graft drawn through the opening in the diaphragm.

Cardio-omentopexy was performed at Lambeth Hospital on Sept. 25th, 1936, with the assistance of Dr. H. E. Mansell and Dr. W. K. Targett under general anæsthesia given by Dr. Hasler. Pericardium found stretched over an obviously hypertrophied heart. At the end of operation the pulse-rate was 72, the B.P. 154/92, and the electrocardiogram showed no change. After purulent bronchitis for a week recovery was uneventful. Three anginal attacks occurred during first 3 weeks and none subsequently. He was allowed up 4 weeks after operation, and was discharged home at his own request 10 days later. The electrocardiogram still showed no change. For 4 weeks at home he showed progressive improvement with increasing activity and freedom from pain. Symptoms of uræmia then appeared; he was readmitted a fortnight later, and

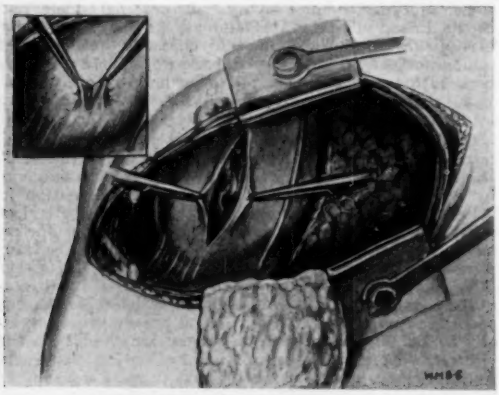

FIG. 12.—Incision of pericardium.

died on Dec. 28th, three months after operation. On readmission there was no evidence of heart failure and no anginal pain, in spite of violent hyperpnœa in Cheyne-Stokes breathing. The B.P. was 140/100, and the electrocardiogram showed considerable increase in voltage. The blood-urea was 116 mg. per 100 c.cm.

Post-mortem findings.—The abdomen contained an excess of free fluid, but the viscera, including the colon, were normal, and the graft could be seen in place passing through the diaphragm. The kidneys showed chronic interstitial nephritis, and there was advanced atheroma of the abdominal aorta. The wound in the chest wall was firmly healed and there had been complete restitution of the thoracic cage. The right pleura contained free fluid in excess but the lung was normal. The lower lobe of the left lung was collapsed, and there was atrophy of the left leaf of the diaphragm. The graft was firmly attached to the heart, and after removal of the viscera injection of a watery suspension of Indian ink was carried out from the abdominal aorta. A pressure of 100 mm. Hg was employed, and the technique was identical with that used in the experimental series (Fig. 1). A very profuse injection of the parietal pericardium was obtained, and ink eventually reached the chambers of the heart. The specimen was fixed in formalin, and on section it was possible to see the ink lying in the myocardium. There was diffuse fibrosis throughout the heart but time has not allowed of complete histological examination.

CASE 4.—A woman, aged 44, a paper-seller. Admitted to Lambeth Hospital on March 5th, 1936, with the story that she had collapsed in the street five weeks before with pain under the heart. She took to her bed for three days. She had been breathless on exertion for a fortnight before the attack, and had since noticed increasing cough and breathlessness and a "stitch in the heart

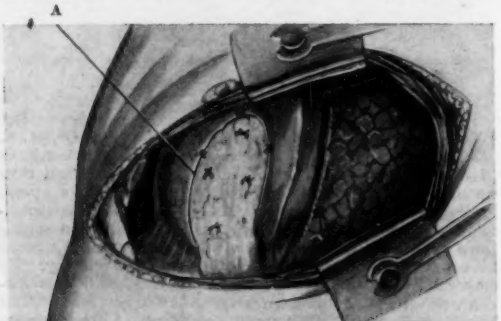

FIG. 13.—The graft sutured to the pericardium. (A = cut edge of pericardium.)

on hurrying." Findings on admission: afebrile; cyanosed and dyspnœic; gross oral sepsis; heart enlarged with tachycardia and gallop rhythm; B.P. 200/140; basal râles; liver palpable; no œdema; electrocardiogram showed inversion of T wave in all leads; Wassermann reaction negative. A diagnosis of coronary thrombosis and hypertension was made.

In spite of rest in bed progressive heart failure ensued, and on July 10th, four months after admission, examination showed: heart grossly enlarged clinically and radiographically; gallop rhythm unchanged; B.P. 170/130; venous blood pressure 270/280 mm. of saline; basal râles and a small pleural effusion on left side; liver much enlarged; ascites; much œdema of legs and lumbar region; inversion of T wave of electrocardiogram as before. From this date she gradually improved. The abdomen was tapped twice, and caffeine, digitalis, and Salyrgan were administered. In September all her teeth were extracted. On Oct. 1st, seven months after admission, she was up two hours daily, and symptom-free except for slight dyspnœa on exertion. Gums well healed; heart not enlarged clinically, a radiogram showing remarkable decrease in its transverse diameter; gallop rhythm unchanged; definite pulsus alternans, confirmed by sphygmomanometer; B.P. 210–190/120; venous blood pressure 160–165; pleural rub at left base, but no

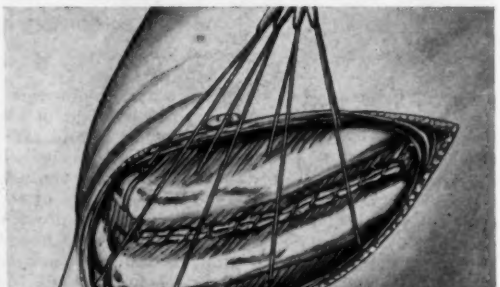

FIG. 14.—Closure of chest wound.

râles; liver edge just palpable; no ascites or œdema; increase of voltage and less inversion of T wave of electrocardiogram.

Cardio-omentopexy was performed at Lambeth Hospital on Oct. 2nd, 1936, with the assistance of Dr. Mansell and Dr. W. H. Gabb under general anæsthesia by Dr. Hasler. Aleuronat injected into pericardium. At the end of the operation the pulse-rate varied from 100 to 120, the B.P. was 104/80, and the electrocardiogram showed no change. Recovery was uneventful. Four weeks after operation the heart sounds had improved in tone, there was no gallop rhythm or pulsus alternans, and the B.P. had recovered to 150/90. The electrocardiogram showed progressive changes towards preponderance of the left ventricle. She is now up for several hours daily and free of symptoms. Fig. 15 shows the healed incision.

CASE 5.—A missionary's widow, aged 65, who had led a strenuous life for many years in high altitudes. Angina pectoris for twelve years. Attacks had become more frequent and more severe, and she had been almost confined to bed for over 18 months, being now unable even to wash herself. A sister has angina. She was referred to the clinic by Dr. L. Lyne of Hove, and was admitted on Oct. 1st. Examination: very obese; heart enlarged to anterior axillary line; soft aortic systolic murmur and very short diastolic whiff; radiogram confirmed cardiac enlargement; B.P. 247/117; no œdema; electrocardiogram showed complete bundle-branch block with large amplitude of Q R S complexes in leads I and III.

After ten days' treatment with general massage, starch free diet, and administration of Theamine and Amytal,

cardio-omentopexy was performed at Lambeth Hospital on Oct. 16th, 1936, with the assistance of Dr. Mansell and Dr. Berry under general anæsthesia by Dr. Hasler. Aleuronat was injected into the pericardial sac and at the site of graft. At the end of operation the pulse-rate was 69, the B.P. 170/90, and the electrocardiogram showed no change. Recovery was interrupted by a paroxysm of auricular fibrillation, which began 30 hours after operation and ceased spontaneously 9½ hours later. There were two anginal attacks during the first fortnight and none subsequently. General massage was begun after five weeks, and she was allowed to wash herself. In six weeks the blood pressure had returned to 240/112 and was causing symptoms. She is now getting up daily for 1–2 hours and has kept free of angina. On a balanced diet the blood pressure has fallen to 210/120. Physical signs of pulmonary collapse have been present at the left base since operation. The electrocardiogram shows no change.

CASE 6 (Mr. George Mason).—A man, aged 63, had suffered from angina for some years. He was finally reduced to a state in which walking the length of the ward brought on a severe attack. He was investigated and referred for operation by Dr. W. G. A. Swan. On Nov. 4th, 1936, cardio-omentopexy was performed at the Newcastle General Hospital by Mr. Mason with my assistance under general anæsthesia by Dr. Philip Ayre. There was no post-operative shock and recovery was uneventful.

POST-OPERATIVE COURSE

In no case has there been any immediate anxiety either during the operation or in the post-operative period.

It was clearly essential before contemplating a major operation on the type of patient who suffers from cardiac ischæmia that it should be conducted without disturbance of the normal physiology of the chest, and also that shock should be eliminated. The first essential was secured by the use of oxygen under positive pressure, so that transpleural exploration of the heart could be accomplished without disturbance. The elimination of surgical shock was attained in the first place by skilful anæsthesia, and, secondly, by the application of some work on traumatic shock by Slome and myself (1935) in the laboratories of the Royal College of Surgeons. We showed that only two factors were concerned in the ætiology

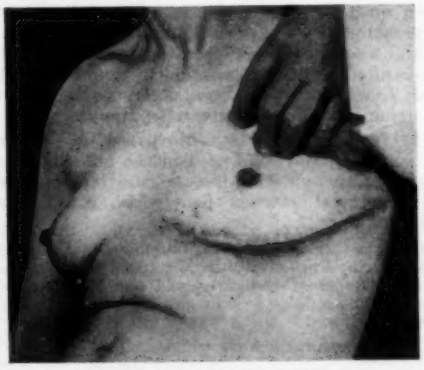

FIG. 15 (Case 4).—The incision.

of shock—namely, fluid loss at the time of trauma, and nervous impulses generated in the traumatised area and transmitted for some considerable period after the trauma had been inflicted. In the operation of cardio-omentopexy an approach is used which permits of an almost bloodless exposure of the heart. No large vessels are divided, and immediate hæmostasis of any smaller vessels encountered is easily possible—and of greater importance is the fact that the phrenic nerve, the main sensory nerve of the region, can be immediately blocked so that nociceptive impulses cannot ascend it either during the operation or in the days following.

THE IMMEDIATE RESULTS

It is the purpose of this lecture to demonstrate that cardio-omentopexy is a feasible operation attended with a low immediate mortality. A subsequent and detailed report will be published by the medical staff of the Lambeth Cardiovascular Clinic on the after-history of the patients submitted to it. According to our experimental evidence, although vascular connexions are present and demonstrable in three weeks vascularisation increases with time and does not attain its greatest development for at least a year.

Our immediate results may be summarised as follows. Patient No. 1 died of a hæmorrhage from a chronic duodenal ulcer a week after operation. No. 2 has left hospital in apparently good order. No. 3 has now a normal pulse, can sleep lying down, and has a normal degree of activity. No. 4 had a period of relief from his angina of effort but died of uræmia three months after his operation. No. 5 has already gained a degree of activity forbidden her previously by her anginal seizures. No. 6 has left hospital in excellent condition, and his progress will be reported by Mr. Mason.

Post-operative complications have not been observed in our present series. A temporary paresis of the diaphragm is naturally associated with some degree of collapse of the lower lobe of the left lung, but this does not seem to be of any great significance, and indeed most of our patients have shown signs of renewed diaphragmatic activity three months from the operation; full activity should not be longer delayed than six months. There has been no case of diaphragmatic hernia; the omentum is of course the natural agent for the repair of wounds in the diaphragm—an excellent specimen, No. 1160 (war collection) in the museum of the Royal College of Surgeons, illustrates this point—and though I have transplanted omentum into the chest of at least 150 animals in the past six years a diaphragmatic hernia has developed in only one of these.

Before concluding this lecture I should like to discuss the alternative operation devised by Beck, in which a pedicled graft of the pectoralis major muscle is sutured to the heart. Beck has the distinction of being the first surgeon to attempt the direct relief of cardiac ischæmia, and with considerable success—in one of his early cases the patient resumed work as a gardener. His operation according to the latest figures (August, 1936) has six survivors. There have been five immediate deaths, all in cases with very advanced coronary sclerosis; one from thrombosis of the abdominal aorta, one from thrombosis of the middle cerebral artery, one from mediastinitis, one from a coronary attack, and one presumably from heart failure. Beck suggests that the comparatively high incidence of post-operative thrombosis may be related to the extensive dissection of the pectoral muscle necessary in the preliminary stages of his operation. From my experience of the Brauer operation for mediastino-pericarditis, which requires a similar exposure, I do not feel that the factors producing post-operative shock can be so well controlled in Beck's operation as in cardio-omentopexy. In my hands, at least, it would be a more serious operation; and for this reason, apart altogether from the obvious

advantages of the omentum over muscle as a vascularising agent, we have not used it in the Lambeth clinic.

Summary and Conclusion

The pathology of cardiac ischæmia has been reviewed, the natural processes of repair have been described, and some account has been given of experimental methods of initiating and supplementing these processes. In the Lambeth Cardiovascular Clinic we have established that cardio-omentopexy can be performed without immediate disturbance even in a type of patient ill-suited to most surgical procedures; our patients have included a man aged 72 and a bedridden woman of 65. There has been no post-operative shock and the only immediate death (7 days after operation) was due to a cause unrelated to the cardiovascular system. The graft fulfils the immediate function of supplementing the blood-supply to that portion of the myocardium still capable of activity, it prevents further necrosis of any area so ischæmic as to have lost its active function, and it should in some measure act as an insurance against any further obliteration of the coronary tree.

I have many acknowledgments to make: to the Medical Research Council, who have enabled me to do this work; to the council of the Royal College of Surgeons, who have provided facilities both at Downe and in London; to Sir Arthur Keith and Dr. John Beattie, under whose direction the experimental work has been conducted; and to Mr. F. Watson, senior technical assistant at the Buckston Browne Farm, for his invaluable assistance and advice.

I also owe acknowledgment in this as in all my work to Prof. Ferdinand Sauerbruch, whose disciple I have been since 1931.

I am indebted to Sir Frederick Menzies, medical officer of health of the London County Council, and to the medical superintendents and pathologists of Lewisham Hospital and St. James's Hospital for the clinical and pathological facilities afforded me since 1932. The Lambeth Cardiovascular Clinic owes special acknowledgment to Dr. P. J. Watkin, medical superintendent of Lambeth Hospital, and Mr. G. F. Stebbing, surgical consultant, for the ready solution of many administrative and clinical problems, and I am personally most grateful to Lord Dawson for his introduction to this lecture and for his stimulating criticism and advice from the earliest stages of the work.

REFERENCES

Beck, C. S. (1936) *J. thorac. Surg.* **5**, 604.
— and Tichy, V. L. (1935) *Amer. Heart J.* **10**, 849.
Büchner, F., and von Lucadou, W. (1934) *Beitr. path. Anat.* **93**, 169.
— Weber, A., and Haager, B. (1935) Koronarinfarkt und Koronarinsuffizienz. Leipzig.
Fugiami, A. (1906) *Virchows Arch.* **189**, 447.
Goldenberg, M., and Rothberger, C. J. (1933) *Z. klin. Med.* **123**, 490.
Hughson, W. (1927) *Arch. Surg. Chicago*, **15**, 418.
Kirschner, O. (1920) *Arch. klin. Chir.* **114**, 606.
Klose, H. (1921) *Ibid*, **117**, 138.
Koch, W., and Kong, L. C. (1932) *Beitr. path. Anat.* **90**, 21.
Kountz and Hamouda, cited by Parade, G. W. (1935) *Med. Klin.* **31**, 952.
Leriche, R. (1935) Macewen Memorial Lecture for 1934, Glasgow Univ. Publications, No. 35.
— and Fontaine, R. (1932) Rapport du 41 Congrès français de Chirurgie Paris.
— — (1933) *Bull. Soc. nat. Chir.* **59**, 218.
Levine, S. A. (1936) Clinical Heart Disease. Philadelphia.
Mandl, F. (1925) *Arch. klin. Chir.* **136**, 455.
Morison, J. R., and Saint, C. F. M. (1935) An Introduction to Surgery, Bristol, p. 268.
Moritz, A. R., Hudson, C. L., and Orgain, E. S. (1932) *J. exp. Med.* **56**, 927.
O'Shaughnessy, L. (1933) *Med. Pr.* **135**, 150.
— (1936) *Brit. J. Surg.* **23**, 665.
— and Slome, D. (1935) *Ibid*, **22**, 589.
Parkinson, J., and Bedford, D. E. (1928) *Heart*, **14**, 195.

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IS p-AMINOBENZENESULPHONAMIDE THE ACTIVE AGENT IN PRONTOSIL THERAPY?

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BOTH Prontosil and *p*-aminobenzenesulphonamide (sulphanilamide) have a protective action against infection by hæmolytic streptococci. Colebrook, Buttle, and O'Meara (1936) have shown that whereas sulphanilamide has a directly inhibitory action on the bacteria in vitro, prontosil has no such action. The hypothesis has been advanced by Tréfouel and others (1935) that prontosil itself has no antibacterial action but is effective only when reduced to sulphanilamide in the body. The following work is an attempt to discover whether sufficient sulphanilamide is produced in prontosil-treated animals to account for the protective action obtained.

Sisley and Porcher (1911) have shown that while azo dyes, for example chrysoidine, given by mouth are reduced to the corresponding amines, azo dyes administered subcutaneously are not so reduced. Kellner (1936) found that in the rabbit only 22 per cent. of injected prontosil was recovered from the urine. The urine contained no sulphanilamide, but it reduced Fehling's solution, from which he inferred the presence of the partially reduced hydrazo compound. When prontosil was given by mouth to dogs, rabbits, and humans, the urine after diazotising and coupling with β-naphthol showed an increased red colour, taken by Kellner to indicate the presence of sulphanilamide. This evidence is not very satisfactory, for the prontosil Kellner used itself shows an increased colour when diazotised and coupled with β-naphthol.

Prontosil is active when given by injection or by mouth. It is therefore necessary to show the production of sulphanilamide from both injected and orally administered prontosil. In the following work, prontosil and sulphanilamide estimations have been made on the urine of patients receiving prontosil by mouth and by injection, and on the urine of both normal and infected mice after prontosil injection. Sulphanilamide has been found in significant amount in all cases, and in addition has been isolated from the urine of a prontosil-treated patient.

The two varieties of prontosil used by Colebrook and Kenny (1936) were used in the following experiments. Although both have a curative action there are differences between them which it is necessary to explain.

One variety, "Prontosil," is 4′-sulphamido-2:4-diaminoazobenzene hydrochloride. It is sparingly soluble, dissolving in 1600 parts of slightly acid water and in 20,000

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Rein, H. (1931) *Z. Biol.* **92**, 101.
Sauerbruch, F. (1931) *Arch. klin. Chir.* **167**, 586.
— (1936) *Lancet*, **2**, 775.
Spaltenolz, W. (1934) Die Arterien der Herzwand. Leipzig.
Steel, D. (1934) *J. Amer. med. Ass.* **102**, 432.
Sternberg, M. (1910) *Wien. med. Wschr.* **60**, 14.
Thorel, C. H. (1903) *Ergebn. allg. Path. path. Anat.* **9**, 673.
Turner, G. G. (1909) *Brit. med. J.* **2**, 1226.
— (1937) Personal communication.
Vogt, A. (1903) *Berl. klin. Wschr.* **40**, 834 (Extr.).
Wilkie, D. P. D. (1911) *Brit. med. J.* **2**, 1103.

parts of slightly alkaline water. It is therefore excreted very slowly, a large dose still colouring the urine weeks after administering. It has a stronger colour in acid than in alkaline solution, and may be diazotised and coupled to give a more intensely coloured dye. When it is reduced it gives sulphanilamide and tri-amino benzene. This latter compound is unstable and is almost certainly destroyed in the body.

The other variety, "Soluble Prontosil," the sodium salt of 4′-sulphamido-phenyl-2-azo-7-acetylamino-1-hydroxy-naphthalene-3:6-disulphonic acid, is soluble up to 4 per cent. in water. It is rapidly excreted, practically all in the first few hours after a dose. It gives a much deeper colour in alkaline solution than in acid solution, and cannot be further diazotised. Reduction of this prontosil yields sulphanilamide together with 2-amino-7-acetylamino-1-hydroxy-naphthalene-3:6-disulphonic acid. This does not give the diazo reaction, but does so after acid hydrolysis.

METHODS OF ESTIMATION

Either variety of prontosil may be estimated by comparing the colour of the urine with that of a solution of the corresponding prontosil of known strength and the same *p*H. "Soluble prontosil" can be estimated in the presence of "prontosil" in strongly alkaline solution, when the colour of the second is negligible compared with that of the first, but no method has been found of estimating the second when the first is present. Sulphanilamide estimations were made by first removing the prontosil by boiling the strongly acidified urine with charcoal, cooling to 0° C., adding excess of sodium nitrite solution, and after a few minutes adding alkaline β-naphthol and caustic soda. The red solution thus obtained was then compared in the colorimeter with that obtained in the same way from a solution of sulphanilamide of known strength. This reaction, the diazo reaction, is given by sulphanilamide by reason of its amino group attached to the benzene ring, and is not specific for that compound, but normal urines and blood filtrates do not give the reaction.

Soluble prontosil was reduced both by stannous chloride and by sodium hydrosulphite, and the amino-acetylamino-naphthol-disulphonic acid separated by acidifying and saturating with salt. This compound did not give the diazo reaction, being decomposed by the nitrous acid.[1]

Sulphanilamide is excreted partly in a conjugated form, and the total sulphanilamide was obtained by boiling the decolorised urine in N hydrochloric acid for 15 minutes before diazotising. The sulphonic acid produced by the reduction of the soluble prontosil is also hydrolysed by the acid, and then gives the diazo reaction.

Sulphanilamide may be estimated in blood by the following method.

One c.cm. of blood is laked with 2 c.cm. of water, 1 c.cm. of 20 per cent. trichloracetic acid added, and the blood filtered at the pump. The filtrate is cooled in ice, and one drop of 0·5 per cent. sodium nitrite added. Equal volumes of standard solutions of sulphanilamide in acid are treated similarly. After a few minutes one drop of 1 per cent. alkaline thymol and 0·2 c.cm. of 40 per cent. caustic soda are added to all tubes, and the blood filtrate is compared in the colorimeter against the appropriate standard.

This method has been found to give a fairly accurate determination of sulphanilamide added to normal blood down to a concentration of 1 mg. per 100 c.cm.

[1] Other amino-naphthol-sulphonic acids were prepared, and some of them failed to give the diazo reaction, particularly those in which the amino and hydroxyl groups were in adjacent positions in the ring, as in the compound under consideration.

PRONTOSIL AND SULPHANILAMIDE IN THE URINE AND BLOOD AFTER ORAL PRONTOSIL

Determinations were made on many samples of urine from patients who had received prontosil by mouth and soluble prontosil by injection. A few are given in Table I below. Corrections have been made for the presence of two kinds of prontosil, and of interfering substances after hydrolysis. Sulphanilamide is produced from 1·9 times its weight of prontosil and 3·3 times its weight of soluble prontosil, and so in the last column the figures have been multiplied by 2·6 to give the approximate prontosil equivalent of the sulphanilamide excreted.

TABLE I

Patient.	Date.	Prontosil in urine (%).	Sulphanilamide in urine (%).	Prontosil equivalent of sulphanilamide (%).
Mrs. B ..	Aug. 10th	0·15	0·15	0·39
	„ 11th	0·05	0·15	0·39
Mrs. S ..	„ 10th	0·05	0·12	0·31
	„ 12th	0·13	0·14	0·36
Mrs. D ..	„ 12th	0·15	0·08	0·21

These figures show that up to 75 per cent. of the excreted prontosil was in the reduced form.

The total three days' urine of Mrs. G was assayed at frequent intervals, during which time she received 4·8 g. of prontosil by mouth and 3 g. of soluble prontosil by injection. A total of 0·8 g. of soluble prontosil was found in the urine. If we assume that an equal amount of prontosil was excreted (certainly an over-estimate owing to the much slower excretion of this substance) a total of 1·6 g. of prontosil is obtained. The free sulphanilamide was 0·36 g., and the combined was 0·47 g. If we assume that half this combined sulphanilamide was really another substance, we get a total sulphanilamide of 0·6 g. If this is multiplied by 2·6, a prontosil equivalent of 1·6 g. is obtained. In other words, at least half the excreted prontosil was in the reduced form.

Sulphanilamide does not appear in the urine until 4–6 hours after the first dose of prontosil.

Isolation of sulphanilamide from patient's urine.—The final proof of the presence of sulphanilamide was obtained by isolating the substance from the urine in the following way.

The urine was acidified and decolorised, and the sulphanilamide precipitated as a mercury salt, which was removed and decomposed with hydrogen sulphide. The mercury-free solution was evaporated to dryness, and the sulphanilamide separated from other substances by repeated extractions with acetone. It was finally purified by crystallising three times from water. It then melted at 162–3° C. A sample of sulphanilamide and a mixture of this with the recovered substance also melted at 162–3° C., showing that the two substances were identical. The acetyl compounds from both melted at 214–5° C.

TABLE II

Day of treatment.	Sulphanilamide in blood (mg. per 100 c.cm.).
1st	0·93
2nd	2·2
3rd	1·7

Sulphanilamide in the blood of a prontosil-treated patient.—Sulphanilamide was found in the blood of

the one patient tested. The concentrations are given in Table II, and are of the same order as those in the blood of sulphanilamide-treated patients (1·0 to 4·0 mg. per 100 c.cm.).

Excretion of orally administered sulphanilamide.—Table III gives the amounts of free and total

TABLE III

Patient.	Date.	Sulphanilamide in urine (per cent.).	
		Free.	Total.
Mrs. F ..	Oct. 12th	0·105	0·222
Mrs. L ..	Nov. 30th	0·018	0·037
Mrs. B ..	Dec. 18th	0·147	0·322
Mrs. G ..	„ 29th	0·095	0·222

sulphanilamide in the urine of patients receiving this drug by mouth, and is included to show that humans excrete about half the total in a conjugated form (average figure, 55 per cent.).

EXCRETION OF PRONTOSIL AND SULPHANILAMIDE BY MICE

The mice were kept in groups of ten in a metabolism cage, and the urine was collected in a tube cooled in ice contained in a vacuum flask. The urines were removed at intervals for analysis. The prontosil and sulphanilamide were estimated as previously described. The infected groups were given 0·00003 c.cm. of a virulent culture of Group A hæmolytic streptococci, Richards, intraperitoneally, and received their first dose of drug subcutaneously two hours later. The normal mice received one dose of drug per day, and the infected groups two injections on the first day and one on succeeding days. Controls were given the same dose of streptococci but no drug.

The experiments were usually allowed to continue for two days. The mice were then transferred to their boxes, and the survival of the infected mice noted.

(*a*) *Excretion of sulphanilamide.*—A preliminary experiment was done on the excretion of subcutaneously administered sulphanilamide by mice. Table IV gives the results obtained with normal and infected animals. Details have been left out of the Table, which gives the total amounts received and excreted per mouse during the 48 hours of the experiment; the rates of excretion of the sulphanilamide are discussed in a later section.

TABLE IV

Mice.	Sulphanilamide injected (mg.).	Sulphanilamide excreted.		Per cent. of injected.
		Free (mg.).	Total (mg.).	
Normal ..	15	6·1	9·6	65
„ ..	7·5	2·9	4·9	65
Infected ..	22·5	6·1	10·3	46

It will be seen that two-thirds of the sulphanilamide injected was recovered from the normal mice and half from the infected mice. In both cases 61 per cent. of the sulphanilamide was excreted in the free state. The concentrations of free sulphanilamide in the urine varied from 0·13 per cent. to 0·40 per cent.

(*b*) *Excretion of soluble prontosil.*—Table V shows the total amount of prontosil injected, and the average quantity of soluble prontosil and sulphanilamide excreted per mouse during 48 hours.

TABLE V

Mice.	Soluble prontosil.		Sulphanilamide excreted.	
	Injected (mg.).	Excreted (mg.).	Free.	"Total."
Normal—				
Group 1 ..	25	9·4	..	..
„ 2 ..	30	10·8	1·15	2·56
„ 3 ..	15	6·1	1·12	1·44
Total ..	70	26·3	2·27	4·00
Infected—				
Group 1 ..	22·5	2·0	1·17	1·51
„ 2 ..	30	8·4	1·03	3·19
„ 3 ..	22·5	3·9	0·87	1·14
Total ..	75	14·3	3·07	5·84

Unfortunately the total sulphanilamide cannot be found accurately for the figures include a fraction due to another substance liberated by the acid hydrolysis.

If it is assumed that as in the sulphanilamide experiment 61 per cent. of the total sulphanilamide is excreted free, the corrected total excretion in the normal and infected groups would be 3·7 and 5·0 mg. respectively. However, a larger correction is made, on the assumption that half the combined sulphanilamide is due to interfering substances. This reduces the total sulphanilamide to 3·1 and 4·4 mg. respectively. These figures have now to be multiplied by 3·3 to give the amount of soluble prontosil excreted in the reduced form. To obtain the quantity of prontosil reduced to secure this excretion, a further correction must be applied to allow for the fact that only 65 per cent. and 46 per cent. of administered sulphanilamide was recovered from normal and infected mice respectively, under the same conditions. Table VI gives the results expressed as percentages of the prontosil administered.

TABLE VI

Mice.	Soluble prontosil excreted.		Soluble prontosil.	
	Unchanged (%).	In reduced form (%).	Unaccounted for (%).	Reduced (%).
Normal ..	37·5	13·5	49	22
Infected ..	19·1	19·6	61·3	42

Thus, while the normal groups excreted nearly three times as much unchanged as reduced prontosil, the infected groups excreted approximately equal amounts of each. In the latter case, 42 per cent. of the injected soluble prontosil must have been reduced to obtain this excretion.

The prontosil was eliminated rapidly from the normal mice, the urine containing up to 1·2 per cent. in the first 4 hours, and only a trace 8–24 hours after a dose. The excretion was slower in infected animals, the urine containing only 0·1 to 0·2 per cent. during the first 4 hours, but later increasing in concentration. Only traces of sulphanilamide were

excreted during the first 4 hours, the greatest quantity appearing 8–24 hours after the dose, when the excretion of prontosil had almost ceased.

(*c*) *Excretion of prontosil.*—One group of mice had three doses of prontosil totalling 22·5 mg. suspended in gum saline during the first two days. Urine was collected for 5 days, and the results are given in Table VII.

TABLE VII

Day.	Prontosil excreted (mg.).	Sulphanilamide excreted (mg.).
1st	0·40	0·072
2nd	0·44	0·070
3rd	0·20	0·050
4th	0·15	0·035
5th	0·11	0·043
Total ..	1·30	0·270

In Table VIII the above sulphanilamide figures have been converted to prontosil, and expressed as percentages of the prontosil given. Again it is assumed that the sulphanilamide excreted is only 65 per cent. of the amount actually produced.

TABLE VIII

Prontosil excreted.		Prontosil reduced (%).	Prontosil not accounted for (%).
Unchanged (%).	In reduced form (%).		
5·8	2·3	3·5	90·7

It should be noted that no combined sulphanilamide was found in this experiment. In fact a decreased sulphanilamide reaction was obtained after heating with acid. This is due to decomposition which, owing to the very dilute solutions concerned (1 in 13,000 to 1 in 35,000), more than balanced the increase due to hydrolysis.

These figures show the great difference in behaviour between the two prontosils. A moderate dose of soluble prontosil is practically completely excreted in 6 hours. Only a small fraction of the same dose of prontosil is excreted in 5 days. It is interesting to note that the ratio of prontosil to sulphanilamide excreted by normal mice is about the same for both prontosils, although the insoluble prontosil is retained in the body for a much longer time. This may mean that the reduction is not caused by simple contact with the tissues.

In this connexion it was noticed that the stomach contents of a mouse killed 1½ hours after the injection of soluble prontosil were deeply stained red, while the rest of the body seemed free from dye. A mouse killed 3 hours after injection had a normal stomach, but the contents of the small intestine were stained red. It is possible that the prontosil is reduced in this way in the intestine after absorption into the stomach. This would account for the delay in its excretion in prontosil-treated animals, and agrees with the work of Sisley and Porcher (1911).

DISCUSSION

In normal animals, 35 per cent. of injected sulphanilamide and 49 per cent. of soluble prontosil are not accounted for. This is due partly to slight losses during collection, and a more complete recovery would have resulted if the urine had been collected for a longer period. Only small amounts were found in the body and fæces. A part of these drugs is undoubtedly destroyed in the body. In the case of insoluble prontosil, 90 per cent. was not recovered but a large part of this was left behind in the body, staining the tissues an orange colour, and excretion was still taking place at the conclusion of the experiment.

In infected animals the discrepancies were greater. Fifty-four per cent. of injected sulphanilamide and 61 per cent. of soluble prontosil was not accounted for. This may be due to retention by the inflamed tissues, or to impairment of kidney function.

The infected groups receiving prontosil excreted more sulphanilamide than did the normal groups. The question is whether enough sulphanilamide was produced to account for the therapeutic action of prontosil.

In the soluble prontosil experiment, equivalent amounts of prontosil and sulphanilamide were excreted, and evidence suggests that half the injected prontosil was reduced. Where oral prontosil was also given to patients, a still larger proportion was converted to sulphanilamide. Allowing for the threefold difference in molecular weights, if sulphanilamide is the active agent in prontosil therapy, it should be six times as efficient weight for weight as soluble prontosil. This ratio will be affected if there is any great difference in the rates of elimination of sulphanilamide from sulphanilamide-treated and prontosil-treated animals.

The rates at which normal mice excrete sulphanilamide given by injection and derived from prontosil are given in Table IX.

TABLE IX

Drug given.	Amount injected in 24 hours (mg.).	Per cent. of 24-hour excretion passed in—	
		0–4 hours.	0–8 hours.
Sulphanilamide.	7·5	23	58
,,	3·75	44	74
Soluble prontosil.	(1·0) (produced)	3	13

It will be seen that the smaller the injected dose the more rapidly is the sulphanilamide excreted, and probably the 1 mg. produced in the prontosil experiment would be still more quickly eliminated than the 3·75 mg. dose, if it had been injected. Without making allowance for this, three-quarters of the 24-hourly excretion of injected sulphanilamide has been passed in 8 hours compared with only one-eighth of that derived from prontosil. If the body can make more use of the steady supply of sulphanilamide from prontosil than of the sudden flood of injected drug, this would make prontosil relatively more effective. Further discussion is useless without knowledge of the relative efficiencies of the prontosils and sulphanilamide in curing hæmolytic streptococcal diseases, and this is a problem involving large-scale work both with animals and patients.

In the three groups of ten infected mice (see Table V) receiving an average of 25 mg. of soluble prontosil each, 7, 7, and 5 had died by the fifth day. Six of the ten mice receiving 22·5 mg. of sulphanilamide had died by the fifth day. The experiments thus fail to show any great difference between the two

drugs, but for adequate protection of the animals many more than the three injections received would have been necessary. The four control mice had died by the second day.

If prontosil has more protective power than is accounted for by the sulphanilamide produced from it, this further action must be other than a simple bactericidal one, for prontosil itself has little or no streptococcus-killing power.

SUMMARY

A considerable amount of sulphanilamide is excreted when prontosil is given by mouth or by injection, and it is possible that the therapeutic action of prontosil is due to the sulphanilamide derived from it by reduction in the body.

I wish to thank Dr. L. Colebrook, director, Bernhard Baron research laboratories, for his very real help, and Mr. W. R. Maxted for technical assistance.

REFERENCES

Colebrook, L., Buttle, G. A. H., and O'Meara, R. A. Q. (1936) *Lancet*, **2**, 1323.
— and Kenny, M. (1936) *Ibid*, **1**, 1279.
Kellner, K. (1936) Étude sur l'élimination de la sulphamidochrysoidine (Thèse de Paris).
Sisley, P., and Porcher, C. (1911) *C.R. Acad. Sci., Paris*, **152**, 1062.
Tréfouel, J., and Mme., Nitti, F., and Bovet, D. (1935) *C.R. Soc. Biol. Paris*, **120**, 756.

MIXED MENINGOCOCCAL AND STREPTOCOCCAL MENINGITIS

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CASES of meningococcal meningitis (cerebro-spinal fever) with superadded infection by one or more other organisms have been reported from time to time. Extremely rarely the meningococcus is associated with the colon bacillus, *Bacillus pyocyaneus* or Pfeiffer's bacillus. More often, though still very rarely, the hæmolytic streptococcus is the offending organism. The pneumococcus and the tubercle bacillus are more commonly to be found with the meningococcus and about 50 reported cases belonging to each group were collected by Chalier and Guichard in 1931. Doubtless many others have been noted but not published.

Nothing seems to have been written in this country about the association of meningococci and hæmolytic streptococci in meningitis. The streptococci may be secondary invaders in a case of cerebro-spinal fever or the two organisms may be associated from the beginning, being found in the first specimen of fluid removed by lumbar puncture. In most of the cases recorded the hæmolytic streptococcus has been regarded as the secondary invader.

Tessier and Reilly (1920) give an interesting account of streptococcal infection of the meninges—attributed to erysipelas of the face complicating herpes of the lips—which developed about the eighth day of an attack of cerebro-spinal fever, which had hitherto responded well to serum therapy. The spinal fluid, which was almost clear, became turbid, and hæmolytic streptococci were isolated before death.

Collignon and Maisonnet (1910) reported a case in which meningococci were seen on direct microscopical examination of the deposit from the cerebro-spinal fluid, but a pure growth of short-chain streptococci was obtained on culture. The meningococci were never grown, but the precipitin reaction was positive. Although the patient gave a history of otorrhœa there was no evidence of acute or chronic otitis media; no infection of the mastoid was found at operation or post mortem, and in the absence of a definite focus it was presumed that the secondary infection originated in the nasopharynx, the patient having recently had several attacks of quinsy.

In Barbier and Lebée's case (1922) death was caused by streptococcal meningitis, the organism being isolated about six days after the onset of the primary meningococcal infection. Here again the nasopharynx was regarded as the portal of entry of the streptococcus as also in the case published by Jame, Jude, and Schier (1932). The latter cultivated meningococcus Type B from the cerebro-spinal fluid at the onset of the illness, but four days later, when repeated cultures from the fluid had shown no organisms, a recrudescence of symptoms of meningeal involvement led to further investigation. Lumbar puncture produced turbid fluid under pressure and a hæmolytic streptococcus was isolated in pure culture; a hæmolytic streptococcus was also grown from the blood.

Morquio (1928) found non-hæmolytic streptococci in the cerebro-spinal fluid of an infant towards the end of an attack of posterior basal meningitis.

If there is no definite suppurative focus of secondary infection it may be hard to prove that the cerebro-spinal fluid has not been contaminated from outside—during injection of serum for example. This may often have been a reason against the publication of cases of mixed infection.

CASE REPORT

A boy aged 11 months was admitted to an L.C.C. general hospital on Jan. 13th, 1936, with follicular tonsillitis and left otitis media. For four days before admission he had been continually pulling at his left ear as if in pain, and otorrhœa had begun on the 10th. The discharge quickly dried up under treatment, and the child left hospital apparently quite fit on the 22nd; but he had to be readmitted on Feb. 17th having had attacks of screaming, without obvious cause, during the previous week, and a recurrence of left-ear discharge on the 15th. There was active otitis media with profuse otorrhœa but no demonstrable mastoid swelling or tenderness.

He remained afebrile till Feb. 21st when the morning temperature rose suddenly to 101·4° F. and he vomited. The physical signs, however, remained unchanged—the temperature fluctuating between 100° and 102° F., with a pulse-rate of 150–170 per minute—until Feb. 23rd when the aural discharge suddenly ceased and definite stiffness and rigidity of the neck muscles were noted. Lumbar puncture revealed a turbid fluid under pressure, and Schwartze's operation was performed on the left mastoid. The mastoid cells were found to be diseased and there was a considerable amount of pus in the left antrum. The dura mater bulged on exposure and there was a gush of cerebro-spinal fluid when it was incised, but no frank pus was located. The child passed a fairly comfortable night and next morning (Feb. 24th) the mastoid wound was satisfactory, but the neck muscles were stiffer and the left external rectus of the eye was a little weak. The bacteriological report on the cerebro-spinal fluid of Feb. 23rd was as follows: "Turbid fluid with threads of pus and numerous polymorphs; chlorides 680 mg. per 100 c.cm.: globulin greatly increased in amount; a stained film showed numerous Gram-negative diplococci plus a few Gram-positive cocci; culture on blood agar gave a good growth of meningococci." The pus removed from the left mastoid wound showed hæmolytic streptococci. On repeated lumbar puncture 20 c.cm. of milky greenish fluid was withdrawn and replaced by 10 c.cm. of antimeningococcal serum. The same amount of serum was given intramuscularly.

The child was transferred to the Park Hospital (L.C.C.) on Feb. 25th with a diagnosis of cerebro-spinal meningitis. He was pale, poorly nourished, and obviously very ill (temp. 100° F., pulse-rate 150); though conscious he

was extremely irritable and resented examination. There was definite head retraction and Kernig's sign was positive. The pupils were circular, central, and reacted to light. The optic discs were clear and there was no obvious involvement of the cranial nerves. The knee-jerks and ankle-jerks were present and equal on both sides but the abdominal reflexes were not elicited and the plantar responses were indefinite. Nothing abnormal was found in heart, lungs, or abdomen. A slight purulent discharge was coming from the left mastoid wound, with left otorrhœa, but the right ear and mastoid area seemed normal. Lumbar puncture gave 25 c.cm. of very thick turbid C.S.F. under pressure. Meningococcus antitoxin (P., D. and Co.) was injected, 10 c.cm. intrathecally and 80 c.cm. intravenously. Later in the day lumbar puncture was repeated and 30 c.cm. of very turbid fluid was removed and replaced by 15 c.cm. of serum. The fluid showed 56,000 cells per c.mm., protein 200 mg. per 100 c.cm., chlorides 670 mg. per 100 c.cm., pus cells and Gram-negative diplococci; culture gave a good growth of meningococci Type 2 (Maegraith).

On Feb. 26th the general condition was very poor and the neck rigidity and head retraction were if anything worse. On cistern puncture 15 c.cm. of thick gelatinous fluid was removed with great difficulty and a lumbar puncture at the same time gave very similar fluid. An attempt was made to irrigate the spinal subarachnoid space with warm isotonic saline solution but continuity could not be established. A further 10 c.cm. of serum was given intracisternally and 40 c.cm. intravenously. In the afternoon the right ventricle was explored and 20 c.cm. of slightly blood-stained fluid was withdrawn and replaced by 12 c.cm. of meningococcus antitoxin. As the child's condition became very poor, saline irrigation was not carried out. The fluid from the right ventricle gave a pure growth of hæmolytic streptococci and the fluid from the cistern grew meningococci. This anomalous report led to a closer scrutiny of the blood plates inoculated from the previous specimens of cerebro-spinal fluid, and colonies of hæmolytic streptococci were found even on the plate inoculated from the first specimen of cerebro-spinal fluid obtained on admission. The diagnosis of "mixed meningitis" now presented itself for the first time and changed the whole complexion of the case.

On Feb. 27th only 5 c.cm. of thick pus could be obtained on cistern puncture but 30 c.cm. of very turbid fluid was removed from the left ventricle. Since the inefficacy of antistreptococcal serum therapy in streptococcal meningitis is well recognised, meningococcus antitoxin only, in a dose of 12 c.cm., was injected. Irrigation was considered impracticable owing to the extremely poor condition of the child. Both cistern and ventricle fluid showed streptococci on direct microscopical examination and hæmolytic streptococci plus meningococci on culture. The hæmolytic streptococci now seemed to have gained the ascendancy, for the colonies, which at the beginning of the illness were difficult to locate amid the more abundant meningococcal growth, now definitely outnumbered the meningococcal colonies. Next morning (Feb. 28th) the child was comatose; opisthotonos was accompanied by almost continuous convulsive movements of the limbs which were first noticed during the previous night, and which ended in death.

Samples of fluid were obtained by ventricle, cistern, and lumbar puncture and hæmolytic streptococci were found in all three specimens with a less abundant growth of meningococci in the ventricle and cistern fluids only. The pus from the left mastoid wound gave a 90 per cent. growth of hæmolytic streptococci serologically identical with those isolated from the cerebro-spinal fluid, which belonged to a rather uncommon group (Type 12). No growth was obtained from the blood after 48 hours' incubation.

Post-mortem findings within skull.—Much congestion of the vessels of the dura with loss of continuity and evidence of trauma beside the left mastoid. Greenish-yellow exudate over the entire surfaces of the cerebral hemispheres and cerebellum, particularly abundant at the base of the brain, covering the pons and filling the interpeduncular fossa; also opaque areas of purulent exudate scattered over the surface of the temporal lobe on each side. Subarachnoid hæmorrhages on the left side of the cerebellum anteriorly, the left Rolandic area, and the apex of the left occipital lobe. Left lateral sinus unaffected. Pus in the right middle ear with evidence of spread of infection to the mastoid cells which were broken down and necrotic though the overlying bone was not eroded.

DISCUSSION

The mere presence of an organism in a specimen of cerebro-spinal fluid is not evidence of meningitis: the infection has to be proved by repeated bacteriological examination of specimens removed with rigid aseptic precautions. This was done in the present case. Owing to the preponderance of meningococci in the early specimens the meningococcus can be regarded as the primary invading organism. The left mastoid was undoubtedly the source of streptococcal infection, for the hæmolytic streptococcus isolated therefrom was serologically identical with that later obtained from the cerebro-spinal fluid. A hæmolytic streptococcus was also isolated post mortem from the right mastoid, but we have no evidence that this contributed to the meningeal infection.

The time of onset of the secondary infection is difficult to determine. The presence of acute mastoiditis, complicated by purulent meningitis, was held to justify immediate operation even before complete bacteriological investigation of the cerebro-spinal fluid could be carried out. At operation the dura mater was incised in the search for a possible intracranial collection of pus. This incision may have been the path of secondary infection but it is quite likely that the streptococci reached the meninges by direct extension from the ear, since the cerebro-spinal fluid removed before operation showed many Gram-negative diplococci with Gram-positive cocci. In the light of events it is unfortunate that the idea of a mixed infection was not pursued at that early stage, and that the Gram-positive cocci were regarded as contaminants.

One lesson of the case is that if acute mastoiditis is accompanied by signs of meningitis a complete bacteriological examination of the cerebro-spinal fluid, obtained under rigid aseptic precautions, must be carried out before any operation is attempted. If the meningitis proves to be purely meningococcal spinal drainage with intensive serum therapy (intravenous and intrathecal) is indicated. Conservative measures will usually suffice for the treatment of the associated acute mastoiditis. If on the other hand there is a mixed meningeal infection the usual anti-meningococcal therapy must be combined with immediate operation on the infected mastoid; but unless there is clinical evidence of an intracranial abscess the membranes of the brain should not be opened. Antistreptococcus serum appears to be of little or no value in these infections.

I wish to thank Dr. H. S. Banks, medical superintendent of Park Hospital, for permission to publish the case, and I am indebted to Dr. J. E. McCartney, director of the Southern Group Laboratory, for the bacteriological and pathological findings.

REFERENCES

Adjali, M. (1924) Thèse de Paris, No. 223.
Barbier, H., and Lebée (1922) *Bull. Soc. Pediat. Paris*, **20**, 108.
Collignon and Maisonnet (1910) *Progr. Méd., Paris*, **26**, 421.
Jame, L., Jude, A., and Sohier, R. (1932) *Bull. Soc. méd. Hôp. Paris*, **48**, 1251.
Morquio, L. (1928) *Arch. esp. Pediat.* **12**, 460.
Tessier, P., and Reilly (1920) Congrès de Bruxelles.
Vialard and Darleguy (1925) *Bull. Soc. méd. Hôp. Paris*, **49**, 1073.

OVERBREATHING TETANY

CHANGES IN THE CALCIUM OF SERUM, SERUM-ULTRAFILTRATES, AND CEREBRO-SPINAL FLUID

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THE chemical changes both in the blood and urine during overbreathing tetany have been extensively investigated, and recently Barnes and Greaves (1936) have extended their investigations in two cases to include the cerebro-spinal fluid (C.S.F.). These authors considered on the basis of certain published work that they were justified in "using the C.S.F. calcium as an index of the diffusible calcium of the blood." The authors stated that they found approximately 0·5 mg. per 100 c.cm. less calcium in the C.S.F. of two patients during an attack of overbreathing tetany than at another, normal (but presumably not immediately preceding), time. Their conclusions were that the diffusible calcium of the serum was reduced during overbreathing tetany to a still greater extent.

The theoretical assumptions of Barnes and Greaves are not in keeping with modern views of the way in which the C.S.F. is formed. The published evidence has been extensively reviewed by Flexner (1934), Gilligan, Volk, and Blumgart (1934), Greenfield (1936), Kral, Stary, and Winternitz (1929), and McCance (1936)—see also Gregory and Andersch (1936)—so that it is unnecessary to discuss the matter again. It is enough to point out that it is very improbable that the calcium in the C.S.F. is an index of the diffusible calcium of the serum. Nevertheless, the experimental findings of these authors appeared to be so important that it was decided to repeat some of their work under rigid experimental conditions. For this purpose two subjects were selected: a woman, P. Q., aged 34, who suffered from severe attacks of hysterical overbreathing tetany; and a normal woman, M. S., aged 28.

EXPERIMENTAL PROCEDURE

The experiments were carried out at King's College Hospital. After emptying the bladder the subjects sat down on a chair with their arms resting on the back. A needle was inserted into the thecal space in the lumbar region, 5 c.cm. of fluid was withdrawn and the needle left in situ. Blood was also removed from the antecubital vein with very slight constriction or with none at all and allowed to clot under a 1 in. layer of paraffin. At no time was the blood in contact with the air until the plasma had been separated. The subjects next overbreathed voluntarily. When tetany was well established, a second vein puncture was made and a further 5 c.cm. of spinal fluid removed. The subjects were then told to stop overbreathing. The patient was unable to do so and carbon dioxide had to be administered to remove the tetany which was most severe and extended to opisthotonos. A third vein puncture was made and a final 5 c.cm. of spinal fluid was removed as soon as the tetany had quite disappeared. A second specimen of urine was obtained as soon as possible after the third vein puncture. On the next day the serum was separated from the clot and both sera and C.S.F. labelled in cipher and taken at once to Cambridge where the ultrafiltration and all chemical determinations were carried out in duplicate by one of us (Greenberg and Gunther 1929, McCance and Watchorn 1931, Watchorn and McCance 1932).

RESULTS

The protocols of the experiments are given below and the analytical results in the Table. It will be observed that tetany began to develop after a period of only 2½–3 mins.' overbreathing in the normal subject M. S.; tetany began to develop after 3½ mins. in the patient P. Q. The serum calcium rose during overbreathing and fell again immediately afterwards. This rise is in agreement with the results reported by a number of authors. The ultrafiltrable calcium also rose during overbreathing. The ratio of the ultrafiltrable to the total calcium remained virtually unchanged in the normal subject. The ratio fell slightly in the patient throughout the whole experiment but was always within normal limits. The C.S.F. calcium did not fall during over-

Subject M. S. (normal)

Time: P.M.	
4.23–4.25	First collection of blood: under paraffin: negligible constriction.
4.26½ ..	First urine; *p*H 7·0.
4.31 ..	First collection of spinal fluid.
4.32 ..	Began to overbreathe. Respirations 48/min.
4.33 ..	Respirations 48/min.
4.34 ..	Respirations 54/min. Hands trembling, pins and needles; tetany started.
4.35–4.37	Respirations 50, 59, and 49/min. respectively. Tetany severe; considerable pain.
4.39 ..	Second collection of blood begun.
4.40 ..	Stopped overbreathing; second collection of spinal fluid.
4.41 ..	Second collection of blood completed.
4.47 ..	Recovered; third collection of blood begun.
4.47½ ..	Third collection of spinal fluid.
4.49 ..	Third collection of blood completed.
4.53 ..	Second urine; *p*H 7·5.

Subject P. Q. (patient)

Time: A.M.	
10.25 ..	First collection of blood: under paraffin: practically without constriction.
10.34 ..	First collection of spinal fluid.
10.35 ..	Began to overbreathe.
10.38½ ..	Pins and needles.
10.39 ..	Hands trembling.
10.40 ..	Rigid, opisthotonos. Had to be held on chair.
10.41 ..	Second collection of spinal fluid; arms clenched. Second vein puncture impossible.
10.41½ ..	Commenced to breathe CO_2: O_2 mixture.
10.43 ..	Partially relaxed.
10.43½ ..	Second collection of blood; slight constriction.
10.49½ ..	Normal once more, still breathing CO_2: O_2 mixture. Third collection of fluid.
10.56 ..	Third collection of blood.

N.B.—The respirations were not counted but were deeper than those of M. S. Two specimens of urine were obtained, the second not until some time after the main part of the experiment ended and considerable amounts of CO_2 had been breathed. Both were acid and about *p*H 6·5.

Chemical Changes produced by Overbreathing

Subject.	Serum calcium mg./100 c.cm.	Ultrafilt. calcium mg./100 c.cm.	Ultrafilt. % of serum calcium	C.S.F.	
				Calcium mg./100 c.cm.	Inorganic phosphorus mg./100 c.cm.
P. Q. (patient).					
Before overbreathing	9·70	6·00	62	4·81	1·68
At height of tetany	10·71	6·16	58	4·74	1·74
After recovery ..	9·99	5·54	55	4·79	1·70
M. S. (normal).					
Before overbreathing	10·20	5·54	54	4·79	1·81
At height of tetany	10·74	5·95	55	4·81	1·79
After recovery ..	10·30	5·38	52	4·76	1·83

breathing and did not in fact show any significant change. The C.S.F. inorganic phosphorus also showed no significant change during overbreathing.

DISCUSSION

These results do not confirm those of Barnes and Greaves. An obvious criticism of their results is the fact that they do not seem to have taken their specimens of "normal" sera and C.S.F. during the main experiment but at some other time.

Our results differ from those of Barnes in showing a rise of total serum calcium during overbreathing—not an important difference since the rise is known to be a variable phenomenon—and in the constancy of the C.S.F. calcium. The present results conflict with the theoretical conclusions of Barnes and Greaves in the fact that the C.S.F. calcium was considerably below the ultrafiltrable calcium and in that the latter did not fall during overbreathing (Gunther and Greenberg 1931, Herbert 1933).

If the hypothesis of Barnes and Greaves were accepted, it might be argued that since no change was found in the C.S.F., none or only a very small one could be expected in the ultrafiltrate. Herbert (1933), however, and Gregory and Andersch (1936) have shown very convincingly that the C.S.F. calcium does not represent the diffusible serum calcium and that the differences cannot be explained as due to the slow attainment of equilibrium between the C.S.F. and the serum since the differences may be maintained for many weeks.

The results here reported also indicate that the ease with which tetany can be induced by overbreathing has little diagnostic significance (see protocols). The time at which tetany develops and its severity depend upon the susceptibility of the subject to the alkalosis so produced. Thus, tetany may not develop clinically until overbreathing has been in progress for some time, but cases have been recorded in women after very slight hyperventilation (Barnes and Greaves 1936, McCance 1932). In most of the experiments reported tetany has only developed after 15–45 mins.' overbreathing, but it should be noted that women have seldom been the subjects. It is our experience however that mild tetany can sometimes be produced by 4–5 mins.' overbreathing even in normal men, and it is possible that in women the time required may often only be 2–4 mins. However that may prove to be, the present results make it clear that perfectly normal persons may be as susceptible to alkalosis and tetany as those unfortunate people who are liable to attacks of uncontrollable overbreathing and its alarming sequelæ.

SUMMARY

Spontaneous overbreathing in women, sufficient to cause severe tetany, brought about a rise in the serum calcium, a small rise in the ultrafiltrable calcium, but no change in the cerebro-spinal fluid calcium or phosphorus.

Susceptibility to alkalosis tetany varies from one person to another and a high degree of susceptibility is quite compatible with a perfectly normal life. The ease, therefore, with which tetany can be induced has no diagnostic significance.

We are very grateful to Dr. J. C. Winterler and Miss E. M. Widdowson for their help. We are also indebted to the subjects and particularly to M. S. for her whole-hearted coöperation in an experiment which necessitated spending a fine week-end in bed.

(*Continued at foot of next column*)

THE CEREBRO-SPINAL FLUID IN SPONTANEOUS OVERBREATHING TETANY *

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RECENTLY Barnes and Greaves (1936) have discussed the rôle of calcium in spontaneous overbreathing tetany and have recorded cases in which there was a fall in the cerebro-spinal fluid (C.S.F.) calcium during tetany. They suggest that this fall was associated with an alkalosis with consequent lowering of the diffusible calcium of the blood, which lowering was immediately reflected in the C.S.F. calcium content. The following report gives our findings on two such cases of overbreathing tetany in which the C.S.F. and blood calcium contents were estimated; these findings will be shown to disagree with those of Barnes and Greaves.

THE ESTIMATIONS

The two patients were admitted to the National Hospital on Sept. 5th and 4th, 1935.

CASE 1.—A. B., a woman aged 32, had had for seven years attacks characterised by an onset with hyperpnœa, followed by drawing up of the fingers and loss of voice. They lasted several minutes, but in none had she been unconscious. On examination no signs of organic disease of the nervous system were found.

CASE 2.—C. D., a woman aged 27 years. For two years before admission she had suffered from attacks in which she would gradually become stiff in the hands and feet. Occasionally the stiffness would be preceded by a tingling in the fingers and toes. In an attack seen in hospital there was at the onset considerable alteration in the rhythm of breathing, which became very deep and somewhat hurried. During this attack tetany developed. Between the attacks no physical signs of organic alteration of the nervous system could be established.

These two patients were put on a diet containing a known amount of calcium and the calcium excretion in the urine and fæces estimated on the days of examination: Table I gives the results.

Lumbar puncture was performed on both patients, C.S.F. was removed and blood taken at the same time; the lumbar puncture needle was then left in situ throughout the whole of the experiment. Each subject was made to overbreathe and when

* Work undertaken on behalf of the Medical Research Council.

(*Continued from previous column*)

REFERENCES

Barnes, C. G., and Greaves, R. I. N. (1936) *Quart. J. Med.* **5**, 341.
Flexner, L. B. (1934) *Physiol. Rev.* **14**, 161.
Gilligan, R. D., Volk, M. C., and Blumgart, H. L. (1934) *New Engl. J. Med.* **210**, 896.
Greenberg, D. M., and Gunther, L. (1929) *J. biol. Chem.* **85**, 491.
Greenfield, G. (1936) *Edinb. med. J.* **43**, 573.
Gregory, R., and Andersch, M. (1936) *Amer. J. med. Sci.* **191**, 263.
Gunther, L., and Greenberg, D. M. (1931) *Arch. intern. Med.* **47**, 660.
Herbert, F. K. (1933) *Biochem. J.* **27**, 1978.
Kral, A., Stary, Z., and Winternitz, R. (1929) *Z. ges. Neurol. Psychiat.* **122**, 308.
McCance, R. A. (1932) *Quart. J. Med.* **1**, 247.
— (1936) *Lancet*, **1**, 704, 765.
— and Watchorn, E. (1931) *Quart. J. Med.* **24**, 371.
Watchorn, E., and McCance, R. A. (1932) *Biochem. J.* **26**, 54.

tetany was well established, C.S.F. and blood were removed simultaneously. Overbreathing was stopped and when the patients had completely recovered

TABLE I

Calcium Metabolism

—	A. B.		C. D.	
	Date.	Calcium (g. per day)	Date.	Calcium (g. per day)
Intake ..	Oct. 3rd " 4th	1·28	Oct. 10th	1·49
Output .. Urine.	Oct. 3rd " 4th	0·26	Oct. 10th	0·31
Output .. Fæces.	Oct. 3rd " 4th	1·25	Oct. 10th	0·38
Balance		−0·23	—	+0·8

further samples of C.S.F. and blood were removed (Table II). It is of note that in one case tetany occurred in 10 minutes and in the other in 16 minutes, both times being earlier than often occurs in normal subjects, although this is by no means the rule.

TABLE II

Time Relationships of Overbreathing and Tetany

Sequence of events (C.S.F. and blood taken before experiment).	Time. A. B. Oct. 3rd.	Time. C. D. Oct. 10th.
Lumbar puncture	11.27 A.M.	3.8 P.M.
Began overbreathing	11.34½	3.8½
Very slight tetany in hands ..	—	3.13
Severe tetany	11.44½	3.26
C.S.F. and blood taken during tetany	11.46	3.26
Overbreathing stopped	11.48	3.26½
Patient normal. C.S.F. and blood taken	12.1	3.36

The calcium was estimated by Kramer and Tisdall's method (Harrison 1930), the serum having been removed from the blood as soon as was possible. All three specimens of C.S.F. and of serum from each patient were put up simultaneously and in duplicate and in no case was a significant difference in the duplicates found (Table III).

TABLE III

Calcium Estimations (mg. per 100 c.cm.)

—	A. B.		C. D.	
	Blood.	C.S.F.	Blood.	C.S.F.
Before tetany ..	9·7	3·9	10·3	4·2
During tetany ..	9·4	3·8	9·8	4·4
After tetany ..	9·4	3·8	11·0	4·8

RESULTS

It is seen that in both cases there was a slight but definite reduction in the serum calcium during the stage of tetany. Scott and Cantor (1933) found a slight rise, while McCance (1932) found it stationary in one case and very slightly increased in another. In A. B. there was a very slight decrease and in C. D. a very slight increase of the C.S.F. calcium, but both are within the limits of experimental error.

In experimental work upon other substances it has been generally recognised that there is either no rise or only a very slow alteration of the C.S.F. contents on altering those same constituents in the blood (Cumings and Carmichael 1934, Jacobson 1932, Fremont-Smith and Dailey 1925).

From such work it seems very unlikely that there could be changes in the C.S.F. calcium such as Barnes and Greaves describe, especially as such changes would have occurred presumably in roughly 5 mins. —the time taken for tetany to appear. In these experiments of Barnes and Greaves there is no record that the resting specimens were taken immediately before the period of tetany; if they were taken on a previous day they can hardly be described as being necessarily identical with ones that might have been taken at the commencement of the experiment. In our two cases we have overcome such criticism by leaving the lumbar puncture needle in situ throughout.

For a similar reason it does not seem justifiable to us to consider the necessity that C.S.F. must be formed across the endothelium of small vessels of the spinal meninges as Barnes and Greaves have postulated in explaining this decrease in the C.S.F. calcium.

SUMMARY

In two cases of spontaneous overbreathing tetany there was no appreciable decrease in the C.S.F. calcium although a small decrease took place in the serum calcium in each.

BIBLIOGRAPHY

Barnes, C. G., and Greaves, R. I. N. (1936) *Quart. J. Med.* **29**, 341.
Cumings, J. N., and Carmichael, E. A. (1934) *Brain*, **57**, 338.
Fremont-Smith, F., and Dailey, M. E. (1925) *Arch. Neur. and Psych.* **14**, 390.
Harrison, G. A. (1930) Chemical Methods in Clinical Medicine, London.
Jacobson, O. (1932) *Acta psychiat., Kbh.* **7**, 24.
McCance, R. A. (1932) *Quart. J. Med.* **25**, 247.
Scott, J. W., and Cantor, M. M. (1933) *Amer. J. med. Sci.* **186**, 509.

RETROPERITONEAL SARCOMA OF UNUSUAL DISTRIBUTION

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With a Note on the Histology by

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WE have seen references to 24 cases of retroperitoneal sarcoma, but so far none has been exactly parallel with that described here. Judd and Larson (1933) of the Mayo Clinic state that of 46 surgical cases the ratio of male to female patients was 2 to 1. The disease is most common in the fourth,

fifth, and sixth decades of life. The symptoms resulting from the disease are usually vague, and there may be no impairment of health until the lesion has advanced to a late stage. Surgical removal of the lesion was permanently successful in 15 cases. They state that this form of treatment combined with heavy doses of radium and Röntgen therapy is the treatment of choice. In their series the order of frequency was pure sarcoma, fibrosarcoma, lymphosarcoma, myxosarcoma, liposarcoma, fibromyxoliposarcoma, fibromyxosarcoma, myosarcoma, and paraganglioneuroma.

Funk and Wickstrom (1931) quote a case of a man aged 50 admitted to hospital with pain in the left side of lower part of back and left leg.

There was a history of weakness and loss of weight during the last two years. A few days before death he showed signs of meningeal irritation with coma and neck rigidity. The autopsy showed a reticulum cell sarcoma, which was primary in abdominal lymph nodes with metastases in lung, ribs, pancreas, kidneys, and vertebræ.

Pow (1935) quotes a case of retroperitoneal sarcoma with pain referred to the thigh in a man aged 25.

There was considerable rigidity of right loin, but no definite mass was felt. Temperature was not raised; sleep almost impossible; albumin and pus in the urine; moderate leucocytosis. After two days' unconsciousness patient died. Post mortem the kidneys appeared normal macroscopically, but just below the lower pole of the right kidney infiltrating the right iliopsoas muscle was a large fixed sarcomatous mass with many outlying nodules. Nerves running down towards Poupart's ligament were involved. No secondaries were seen in the liver, but both lung bases presented numerous small growths.

Murray Newton (1932) describes a girl aged 17 who had a retroperitoneal sarcoma which apparently disappeared by treatment with radium and deep therapy.

Although not frequently met with, therefore, these cases may occur in any practice, and we make no apology for publishing our own experience.

CASE REPORT

A married woman, aged 68, was admitted to the Royal Waterloo Hospital on May 19th, 1936, at the suggestion of one of us (H. W.) on account of abdominal pain, loss of weight, anorexia, and anæmia.

She was quite well till some 3 to 4 years ago when she developed abdominal pain which came on ½–1½ hours after food. It was relieved by alkalis and eructation. The appetite began to fail and her general health from that time gradually became more and more unsatisfactory.

A year ago she had an acute attack of abdominal pain, central in origin, which passed up the left side of chest, associated with profuse vomiting which lasted 12 hours. Two similar attacks occurred six months ago, when the character of her indigestion changed, there being pronounced anorexia and the pain becoming constant and unrelieved by alkalis. Asthenia and loss of weight quickly followed. Four weeks before admission she complained of pain in the spine and lower part of the back, with weakness that quite prevented her sitting up in bed. A week later there was a "stroke" with loss of power in the legs, slight drooling of saliva from the right side of the mouth, possibly speech defects, and loss of rectal sphincter control. She gradually improved, but there was vomiting again and increased abdominal pain. She was usually constipated, but there was now occasional diarrhœa. Any exercise caused some dyspnœa. The patient has had three children, one of whom died in infancy from caries. Her husband died from tabes dorsalis.

On admission the notes state "patient is a thin cachectic woman; a spotty brown pigmentation is present on chest, abdomen, arms, and legs. Mucous membranes pale; hæmoglobin 45 per cent.; tongue dry and red. The pupils reacted to light and accommodation; no cranial nerve defects found." A few râles were present at the right base. The circulation was normal and the blood pressure was 130/84 mm. Hg.

There was some fullness in the abdomen, especially on either flank, and a sense of resistance in left hypochondrium and partly also in right. There was no indication of fluid. It seemed as if there was a ridge to the right and the left of the stomach, which appeared to be connected with it. These areas were tender and painful. Per rectum some ballooning of the rectum was apparent but no tumour or glands felt, and nothing abnormal was noted per vaginum. Legs thin, reflexes normal. The stools were normal and also the urine.

Left septic parotitis developed with a rise in temperature to 101° F. Having gone steadily downhill despite treatment with liver extract and iron, which produced no effect on the hæmoglobin, the patient died suddenly on June 5th.

Investigations.—Blood count (May 26th):

Red cells ..	.. 2,800,000	White cells	.. 9800
Hæmoglobin	.. 46%	Polymorphs.	.. 71·5%
Colour-index	.. 0·8	Eosinophils	.. 1·5%
		Hyalines ..	.. 6%
		Lymphocytes	.. 20%
		Basophils ..	.. 1%

On June 20th the hæmoglobin was 41 per cent.

Radiogram of stomach: No evidence of new growth of the stomach, but there may be something displacing the stomach to the left.

Occult blood test gave weak positive result with guaiacum, but negative spectroscopically.

Fractional test-meal: There was no blood, bile, or mucus seen; starch was present throughout; free hydrochloric acid and total acidity were within normal limits.

Post-mortem report.—The body was thin and cachectic; rigor mortis present. Left suppurative parotitis. Basal congestion of lungs, but no consolidation; mild atheroma present in the aorta and blood-vessels.

The left and right hypochondrial regions were the site of two large tumours retroperitoneal in position. The left was larger than the right, producing a forward displacement of the stomach. The spleen was compressed to ½ normal size, but otherwise normal. The left tumour, together with the kidney to which it was attached, and the pancreas were removed in one mass. The right was separated from the under surface of the diaphragm, being adherent to it only by fibrous tissue, and removed with the kidney. The tumours were easily removed, invasion of the surrounding tissues apparently being prevented by their capsules fibrous tissue structures ½ in. thick. No evidence of normal suprarenal gland was found on either side, in the tumour or suprarenal area.

The liver showed fatty degeneration and no macroscopic evidence of secondary deposits. The bladder, pelvic viscera, and intestines were normal. No enlarged glands were discovered except in the pancreas (V.I.). The brain was normal; no secondary deposits found.

Histological report.—The specimens brought to the laboratory from the post-mortem room consisted of two large ovoid tumours of approximately 9 × 5 × 4 in. Except at one mid-lateral zone, corresponding in each case to that part of the tumour lying nearest to the spine, each tumour was encased in a fibrous capsule. Both tumours lay completely behind the peritoneum. When cut into, each was found to consist of a massive neoplasm, thrusting aside and quite separate from a compressed but otherwise normal kidney. The growth extended around the renal vessels, encircled the ureter, and was probably continuous with similar growths in the aortic region. The tail of the pancreas was in close contact with but separate from the growth on the left side. On the right side the liver was not adherent to the tumour. Careful search for suprarenal tissue was made in both specimens but none could be found. The central part of the main neoplastic mass was breaking down, resulting in a central cavity about 3 in. in diameter containing necrotic, structureless material and much old and recent blood-clot. In both tumours hæmorrhages probably occurred within 48 hours of death. To the depth of about 2 in. tissues of the tumour had not degenerated, and from this level various sections were cut. The greater part of the neoplasm consisted of sarcomatous tissue in which the

individual cells were round, of medium size, rarely showing a tendency to elongation. They possessed a moderate amount of cytoplasm, and their nuclei stained moderately well (Fig. 1). The intracellular tissue showed some tendency to fibrillation and occasionally well-formed vessels could be seen, but on the whole the vascular channels were very imperfect and poorly supported, many small hæmorrhages being seen. About 5/6 of the whole tumour had the above appearance, but in a few areas the cell type changed and from being chiefly round

1 2

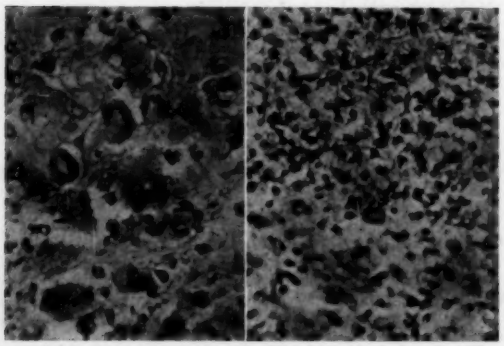

FIG. 1.—Structure of greater part of the sarcoma; medium-sized round cells.

FIG. 2.—Structure of areas comprising about ¼ of the tumour tissue; mixed-celled sarcoma with several giant cells.

became very mixed and included numerous multinucleated giant cells of various sizes. In these zones the vessels were rudimentary and the hæmorrhages more numerous (Fig. 2).

The bulk of the tumours on both sides would be described as a fairly characteristic round-celled sarcoma with local transitions to the mixed-cell type. The general appearances of the specimens suggest a retroperitoneal origin in the aortic region with extension taking place in all directions but most strikingly along the line of the renal vessels, producing two large tumours in the renal region, compressing but not actually involving either kidney. It is a case of retroperitoneal sarcoma of somewhat unusual distribution.

DISCUSSION

There was no evidence of disease of the stomach or bowel, nor of a primary blood disease, lymphadenoma, renal or splenic tumour, or ovarian, pelvic or rectal. There was no reason to suspect hydatids. The probability was in favour of a malignant tumour in the abdomen near the left border of the stomach. The difficulty, however, was to account for the feeling of fullness and resistance to the left and right of the stomach, which appeared to be placed between two resisting areas, but from investigations was apparently normal itself. Was one tumour present or two? That was difficult to determine during life. Her age, wasting, appearance, anæmia, abdominal pain and swelling, together with her history, strongly suggested an abdominal malignant growth. It was hoped to give her the benefit of operation, but her general condition did not merit it. Unfortunately the patient was too weak to have a barium enema and her sudden death prevented further clinical investigations.

REFERENCES

Funk, W. H., and Wickstrom, O. W. (1931) *Nav. Med. Bull., Wash.* **29**, 469.
Judd, E. S., and Larson, L. M. (1933) *Surg. Clin. N. Amer.* **13**, 823.
Newton, T. M. (1932) *Glasg. med. J.* **711**, 136.
Pow, D. L. (1935) *Brit. med. J.* **1**, 596.

AN INVESTIGATION OF THE RELATIVES OF PATIENTS WITH GASTRIC CANCER

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IN studying the rôle of inheritance in the ætiology of gastric cancer we were interested, among other things, in determining a possible connexion between the disease and secretory disturbances.

Our series consisted of 167 relatives of patients with gastric cancer—34 sibs, 103 offspring, and 30 of the more distant relatives. The stomach contents of these relatives was examined by means of the Boas-Ewald test-meal, with the following modification: 60 grammes of unsalted white bread and 250 c.cm. of distilled water. For a control population we used husbands and wives of gastric cancer and ulcer patients, also persons who at one time were operated on for cancer of the breast, uterus, and skin, and their relatives, as well as some other patients. All of these, 150 people in all, were investigated by the above-mentioned method.

Of the 167 relatives, 23 (13·8 per cent.) showed absence of free hydrochloric acid in the stomach contents: among the 67 males there were 10 cases (14·9 per cent.); among the 100 females there were 13 cases (13·0 per cent.) of achlorhydria. The higher frequency of achlorhydria among the relatives as compared with the controls is evident from Tables I and II.

TABLE I

Incidence of Achlorhydria in the Families of Patients with Gastric Cancer and in a Control Population

—	Male (%).	Female (%).	Over 30 years (%).	Under 30 years (%).	Total (%)
Relatives	14·9 ± 4·5	13·0 ± 3·4	30·8 ± 5·7	2·9 ± 1·7	13·8 ± 2·7
Control group	3·2 ± 3·2	8·4 ± 2·5	10·1 ± 2·9	0	7·3 ± 2·1

TABLE II

Details of Age-groups in Table I

Age.	Relatives.			Control group.		
	Total.	Achlorhydria.	Per cent.	Total.	Achlorhydria.	Per cent.
0–10 ..	11	—	—	3	—	—
11–20 ..	44	—	—	22	—	—
21–30 ..	47	3	6·4	16	—	—
31–40 ..	40	11	27·5	38	2	5·3
41–50 ..	12	3	25·0	36	2	5·6
51–60 ..	12	6	50·0	27	7	25·9
61–70 ..	1	—	—	7	—	—
71–80 ..	—	—	—	1	—	—
Total ..	167	23	13·8	150	11	7·3

RESULTS

The presence of a definite familial trend—the high incidence of achlorhydria among the older relatives of patients with gastric cancer—points to some rôle of heredity in the ætiology of this disease. No such trend was noted among the persons who had any

other localised cancer (uterus, breast, skin) and their relatives: among 45 in this group over 30, only 3 cases (6·7 per cent.) had achlorhydria. It seems to us, therefore, that achlorhydria in the families of gastric cancer patients is one expression of the hereditary factors determining the particular localisation of the growth. In some of the cases of gastric cancer achlorhydria appears to be a forerunner of the disease.

DANGEROUS RECTAL TRAUMA DUE TO A RIGID NOZZLE

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An article by H. H. Rayner (*Brit. med. J.* 1932, **1**, 419) attracted my attention at the time, but I confess that, since no case of this kind had been seen by many colleagues or myself in some 25 years of hospital and private practice, I still thought that the risk of serious damage due to a rigid douche nozzle must be very slight. I have been called in consultation to two cases in the period of six weeks. This has impressed on me the real danger of anything other than a rubber tube being passed into the rectum by a nurse, who cannot be expected to have a sound knowledge of the anatomy of the rectum, with its curves, and the valves of Houston, especially as the mucous membrane of the rectum, according to Lockhart-Mummery, is only slightly sensitive above 1½ in. from the anus.

Case 1.—A lady, aged about 55 years, though quite well, was having a course of colonic lavage, as she thought it was a very clean thing to do. She was having the third of the course about 4 P.M. one day when she was suddenly seized with violent pain in the lower abdomen and lower back and collapsed. A nurse came to her aid, but a minute or so elapsed before the douche was stopped and she was lifted on to a couch, where she was given sal volatile and warm bottles applied. She felt very ill and it was 7 P.M. before she was taken to her flat in a taxi by one of the nurses and put to bed. By 9 P.M. she was feeling worse and sent for her doctor, who called me in consultation.

She was found to be severely shocked and presented the signs of a pelvic peritonitis. On rectal examination no tear could be seen or felt but there was a little blood on the examining finger. A diagnosis of perforation of the rectum was made and operation advised. She was removed to a nursing-home, but then refused operation, and it was 2.30 A.M. before she realised the gravity of her condition and consented.

On opening the abdomen by a median subumbilical incision the pelvic coils of small intestine were found to be injected, and there was about half a pint of thin fluid in the pelvis. No perforation of the peritoneum could be seen, but the striking thing was the enormous extraperitoneal œdema in the pelvis and left side, obscuring the rectum, bladder, iliac and descending colon. Not less than 2 pints of fluid could have distended the tissues in this way. The free fluid was mopped out, a tube drain inserted into Douglas's pouch and the peritoneum closed round this. The extraperitoneal tissues on the left were then opened and a large amount of fluid escaped, a tube was inserted into this region and the skin and subcutaneous tissue closed round this. Lastly a valvular cæcostomy was performed, and an intravenous saline given and the patient returned to bed.

By the 3rd day she appeared to be progressing well; there was almost no drainage so the tubes were removed. On the 8th day her temperature rose to 100° F. and a seropurulent discharge began, which during the next few days became purulent. Her chief complaint was a pain in the lower back, deep to the sacrum. The cæcostomy was functioning well. For the next 3 weeks there was little change, she had a moderate amount of purulent discharge with an occasional foul-smelling slough coming away. In the 4th week some hæmorrhage occurred and she began to lose ground.

A blood transfusion of 300 c.cm. was given and improved her condition considerably. A few days later 400 c.cm. blood were transfused and under gas oxygen an incision was made into the left iliac region. The extraperitoneal tissues were opened and a drain put in where a track was found extending down into the pelvis. Two weeks later as she was not making progress lipiodol was injected through a catheter introduced into the left iliac wound, and a stereoscopic radiogram taken. This showed that there was a cavity at the back of the rectum opposite the lower end of the sacrum, 2½ by 1½ in. in size, corresponding to the position where the penetration of the bowel had occurred, and where the main damage had been done to the tissues.

Naturally, an operation to expose this cavity by removal of the coccyx and lower part of the sacrum was advised, but this was refused for some days, when after a consultation with Sir Thomas Dunhill the patient agreed, and after this made a rapid recovery. The cæcostomy took some time to close completely, and a tiny sinus discharging a little stained mucus remained for another month but then closed without further trouble. She has remained in good health since, and from a reading of the reports of similar accidents appears to have been very fortunate.

The douche nozzle used in this case was brought to me for inspection and is a truly dangerous weapon, consisting of a metal tube, some 12 in. long, as thick as a slate pencil, with a ball joint 4 in. from the end, which had two lateral openings, and which was merely rounded, not mushroomed. I was also informed that the douche can was elevated some 6 ft. above the level of the pelvis. It is easy to imagine this nozzle impinging on the under side of a valve of Houston and some movement on the part of the patient pressing it through the insensitive mucous membrane, and the force of the douche pouring its fluid into the perirectal tissues.

Case 2.—This was a man, aged about 58, of the plethoric type who was accustomed to having his bowels act twice daily, and one day missing his afternoon motion sent to a nearby nursing-home for a nurse to come and give him an enema. This was done with a Higginson syringe with the bone nozzle. Apparently he felt pain almost immediately the nurse commenced the administration, and only two or three bulb-fulls were injected. He had no result from the enema, nor did the fluid return, but there was a little bleeding, thought to be from hæmorrhoids which were present. Next day, feeling far from well and having passed nothing but some blood, he sent for his doctor, who called me in consultation.

On examination the anal region was found to be rather swollen and slightly reddened posteriorly and on the right, and was tender. A rectal examination disclosed a ring of hæmorrhoids, and above this a thickening in the mucous membrane of the right postero-lateral wall of the rectum extended as high as the finger could reach. The actual perforation of the mucous coat could not be seen or felt but there was some bleeding after my examination. A diagnosis of perforation of the mucous membrane with injection of the fluid into the submucous region was diagnosed and operation (cæcostomy) advised, but this was refused by the patient.

Some five days later, during which time he had suffered much pain, he passed a slough about 7 in. long and 1½ in. wide, consisting of the necrosed mucous membrane of the posterior wall of the rectum. He now consented to operation and a cæcostomy was performed. For about 5 days he seemed to be making good progress, and clean granulations were appearing, when he died suddenly from a stroke or possibly a cerebral embolus.

Comparing these two cases, it is interesting to note that the former, though the rectal wall had been

penetrated and perirectal and subperitoneal spaces injected with a large amount of non-sterile fluid, survived after a long illness, whereas the latter, when the mucous membrane was only stripped up and at most a few ounces of fluid injected, died. Both, however, emphasise the great danger of nurses introducing solid nozzles into the rectum, and it should be a definite rule that nothing but a pliable rubber tube should be used for the administration of enemata or for rectal lavage.

CARDIOVASCULAR CHANGES FOLLOWING ARTERIOVENOUS ANEURYSM

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So long ago as 1875 Nicolodami noted that in cases of arteriovenous aneurysm tachycardia might be present and cardiac hypertrophy take place. Wrail in 1877 described the same phenomena. Osler pointed out in 1915 that venous stasis was the most serious sequel, sclerosis of arteries with dilatation developing on the proximal side. He quoted the case of a patient who had in 1898 an arteriovenous aneurysm in Scarpa's triangle, and died in 1911 having suffered pain and progressive failure of circulation due to cardiac changes. For this reason operative measures on the aneurysm were discouraged, the connexion between the arteriovenous aneurysm and cardiac changes as sequelæ not being realised (Wright, 1933).

Lewis and Drury (1923) have pointed out that if the blood leaks from the arterial system through channels other than the natural ones provided by capillaries and at sufficient rate, such leakage will change the blood pressure. It seems a matter of indifference whether the leak is back into the ventricle, into the pulmonary artery via a patent ductus arteriosus, or into a vein by direct anastomosis. The nearer an arteriovenous aneurysm is to the heart, and the larger the communication, presumably the more serious is the factor leading to cardiac embarrassment and stress. Theoretically it seems possible that the negative pressure in the veins close to the heart might become even a positive one, and have pulsation communicated. Under these circumstances an immediate embarrassment of the right heart would be likely to ensue, leading to persistent failure of that side, with lowered blood pressure, especially the diastolic (Hill and Flack sign). This appears to be the explanation of a case quoted by Reid (1931).

A man was shot in the right thigh on August 13th, 1924, and eight days later an expansile tumour with thrill was present. On Sept. 30th an operation was done, the heart being reported as in good condition. In 1928 a recurrence of the arteriovenous aneurysm was found; the heart was now fibrillating and general anasarca present. On July 12th, 1928, a second operation was performed successfully. The cyanosis, venous engorgement of neck disappeared, and the heart gradually reduced to almost normal size.

The same writer also states that excision of the arteriovenous fistula may restore a heart to complete efficiency.

The following five cases are of some interest as indicating: (1) the frequent, if not constant, association between persisting arteriovenous aneurysms and subsequent cardiac changes, of greater or less extent; (2) the period elapsing between the development of the aneurysm, and the occurrence of symptoms due to cardiac changes; and (3) the progressively serious deterioration of the heart, and conversely the chance of improved prognosis if early removal of the aneurysm is successful, even after the cardiac changes have been initiated.

I regret that the notes on the cases are brief and curtailed, and leave many lacunæ on desirable observations, such as those as were made in the study of a similar series by Lewis and Drury, and described in their illuminating report. Recognising these deficiencies I still felt that these records, embracing a period of nearly twenty years, might have some value as regards prognosis and treatment.

ANALYSIS OF CASES

Case 1.—Arteriovenous (A.V.) aneurysm of right thigh. The date of injury was Oct. 17th, 1918, when the patient accidentally wounded his right thigh. In-patient treatment of seven days was required, the wound being ½ in. in extent—depth unknown. The A.V. aneurysm was not diagnosed until May 27th, 1934 (16 years later), when the heart showed only slight enlargement. From 1919, however, the man had had medical treatment for dyspnœa for which there was no adequate explanation, and at intervals from then until 1934 had received treatment for a slightly dilated and rapidly beating heart. In 1934 he consulted a cardiac specialist who found the A.V. aneurysm. The heart was enlarged with tic-tac rhythm. Pulse-rate 116 standing, 100 lying. Blood pressure 130/90. X ray examination showed heart with transverse measurement 5½ in. The urine contained a trace of albumin. The femoral artery was ligatured and the last report in 1936 indicated some improvement, though the blood pressure was higher (170/120) but with normal arteries. Subjectively the cardiac symptoms had improved.

Case 2.—The popliteal arteriovenous aneurysm from gunshot wound developed in 1918 in the right leg and was at once recognised. No operation was performed. By 1922 there were cardiac symptoms and enlargement of the heart was recognised, but the early changes must have been present considerably earlier. Between 1922 and 1930 signs of valvular disease became manifest. In 1924 a thrill was detected over the apex. In 1928 the apex-beat was ½ in. outside the nipple line, and there was a systolic bruit. In 1932 his right leg became swollen and painful. The condition of the heart was as before but with bronchitis supervening. Amputation was considered inadvisable owing to the state of the heart and chest, and the patient died in 1934 from rupture of varicose veins.

Case 3.—Gunshot wound in left groin in November 1917. Early in 1918 an arteriovenous aneurysm in the left femoral was diagnosed. No operation was carried out. By 1921 enlargement of the heart was clearly evident, and by 1931 the compensation had broken down; bruits had developed at the mitral and possibly aortic orifices, and the prognosis was grave. By 1936 there was total disablement. Sclerosis of valves may have been present with a somewhat similar origin to sclerosis of proximal arteries described by Osler.

Case 4.—The patient had a gunshot wound of the left arm on July 1st, 1916, and an A.V. aneurysm had developed by August 16th. Three operations for excision and ligature were performed (August 28th, Nov. 10th, and Dec. 4th) but without success. By 1920 cardiac dilatation and systolic bruit at the apex were present, the latter being ½ in. outside the nipple line. The patient said he had been subject to giddiness and fainting attacks from 1917. Deterioration was slow. In 1935 no material change had taken place in the heart, and he was still subject to palpitation and dyspnœa. Blood pressure 130/85.

Case 5.—On April 24th, 1917, the right thigh sustained a gunshot wound close to the great trochanter, with a

second smaller wound at the inner part of the right groin. A foreign body was removed from the larger one which was found to extend to the bone. By May 24th the wounds were reported as healed, but an A.V. aneurysm had developed between the femoral artery and vein. A "machinery" murmur and thrill could be heard and felt over a wide area, but no further operation was attempted. Function of the leg remained good except on much exertion, but within six months a plexus of veins developed at the back of thigh and knee. In 1920 heart sounds were stated to be normal, but by 1921 there was a systolic aortic bruit and afterwards a mitral systolic bruit. The man, however, did not complain of dyspnœa until early in 1923 when the apex-beat was in the nipple line, with an apical systolic bruit and thrill. The blood pressure was 120. The aortic murmurs seemed to have disappeared. By 1924 there was considerable deterioration with cardiac irregularity and palpitation obvious to the patient. He remained in much this state until 1932 when the dyspnœa increased and was accompanied by precordial pain. Death took place after a sudden collapse when the man was taking a short walk.

CONCLUSIONS

1. From an analysis of these cases it appears that cardiac changes depend to some extent, in time of onset and severity, on the type of arteriovenous aneurysm and its amenability to operation. Early cardiac changes probably date from the establishment of the aneurysm, but do not necessarily cause symptoms for a few years. Systematic examination of the heart however would bring these changes to light if the probable developments were more fully recognised. A late involvement of valves of sclerotic character is likely in progressive cases. This was, in two cases, the main factor in termination of life (16 and 18 years after the original injury), and of causing total disablement in a third case (19 years after the injury).

2. Early surgical treatment for removal of the arteriovenous aneurysm, or its obliteration by ligature, is strongly to be advised on medical grounds, apart from surgical considerations, in order to prevent the cardiovascular changes which are almost inevitable sequelæ and an increasing cause of disability.

My grateful acknowledgments are due to Dr. J. H. Hebb, director-general of medical services, Ministry of Pensions, for permission to publish these records.

REFERENCES

Lewis, T., and Drury, A. N. (1923) *Heart*, **10**, 301.
Osler, W. (1915) *Lancet*, **1**, 952.
Reid, M. R. (1931) *Amer. J. Surg.* **14**, 17.
Wright, A. D. (1933) *Lancet*, **2**, 1245.

MEDICAL SOCIETIES

BRITISH INSTITUTE OF RADIOLOGY

AT a meeting of this institute held on Jan. 14th, the president, Prof. J. A. CROWTHER, being in the chair, a paper on

Cerebral Arteriography

was read by Dr. H. W. DAVIES. A certain amount of work on cerebral angiography had, he said, been done in this country but very little had been heard of it. Cerebral tumour was a sufficiently distressing disease to make any weapon of investigation a thing not to be ignored. Cerebral angiography had been first attempted by Egas Moniz of Lisbon in 1929, after two years' experiments on animals and corpses. In 1931 one of his colleagues, Dr. Almeda Lima, had demonstrated it in London at the National Hospital, Queen-square, using sodium iodide as the radiopaque medium. This salt was opaque enough for the purpose but had proved too risky when there was any arterio-sclerosis. Thorotrast was now used, injected into the common carotid artery after its exposure through a small cervical incision. The operation was performed in the theatre under local anæsthesia, after a general sedative. Lateral views only were necessary in most cases. The surgeon used a long curved needle, of not too large bore, as the artery lay somewhat deeply in the wound. The amount injected was 10–12 c.cm. for the arterial system or 15–17 c.cm. for the venous system. Some force had to be used to get the rather viscous thorotrast through the narrow needle, so the surgeon must have all possible freedom of movement and be able to steady himself. The first film was taken when about 10 c.cm. had passed out of the syringe, and the exposure must be short, about 1/10th sec. The head must be centred on the cassette before the injection started. Shock-proof apparatus was most desirable. Thorotrast did not mix intimately with the blood, and so the veins could be visualised. By means of a new apparatus cassettes could be slid under the head and six films taken at intervals of a second. From the blood stream thorotrast was eventually picked up by the cells of the reticulo-endothelial system. In view of the amounts formerly used for visualisation of the liver and spleen, it might be said that the small doses used for radiography were reasonably safe. One objection was that its continuing radio-activity might ultimately produce fibrosis in the reticulo-endothelial system. It was imperfectly eliminated, and remained in the system for years and might become partially converted into mesothorium and radiothorium. Cerebral arteriography should therefore not be lightly undertaken, but the conditions in which it was applicable were sufficiently serious to justify the slight risks.

The first discovery made had been that the blood-supply of the brain passed to it much more quickly and in greater volume through the internal carotid artery than did the blood flowing to the superficial tissues by the external carotid. The superficial vessels therefore did not obscure the intracranial ones until some seconds after an injection into the common carotid. Probably this was due to the size of the capillaries, which were larger and more numerous and also more dilated, during mental excitement, than the general body capillaries. Another factor was the anatomy of the external carotid which soon gave off a number of large branches. The only immediate small branch of the internal carotid was the anterior communicating artery, which in fact rarely appeared in the arteriogram. In effect, the external carotid was like a river delta. The internal carotid described a complicated system of curves which had diagnostic importance. According to the anatomical text-books it first curved back and then ran forwards again, but this was seen arteriographically in 30 per cent. of cases only; and in 70 per cent. it formed a complete S, and then divided into anterior and middle cerebral, the latter splitting almost at once into three branches which formed one of the best landmarks: the Sylvian group. The curves of the parent trunk had been termed the

carotid syphon. The ophthalmic and the anterior choroidal arteries might also prove of diagnostic importance. The communicating arteries were not often seen, but the posterior part of the circle might be visualised by injecting thorotrast into the subclavian artery by a small subclavicular incision and compressing the artery beyond the point of injection. Regurgitation of blood drove the thorotrast back into the basilar trunk which would be found to rise almost vertically from the base of the skull.

Abnormalities of the vessels themselves and of their position were the diagnostic points made apparent by arteriography. Their grouping would sometimes indicate the tumour, and some tumours had greater blood-supply than others. Frontal lobe tumours showed absence of the upper bend of the syphon so that the curve was a U open posteriorly. The whole Sylvian group was pushed downwards, and the anterior cerebral was displaced backwards and downwards. A tumour in the front would push the Sylvian group somewhat downwards, but the displacement was still more marked if the tumour was situated further back. Midline tumours tended more to displace the syphon downwards so as to give a very marked curve to the anterior cerebral and pericallosal arteries. The Sylvian group was pushed upwards and widely separated by suprasellar tumours and the internal carotid displaced sideways. Temporal tumours pushed up the Sylvian group, leaving a margin round the tumour, and narrowed the syphon. Deep temporal tumours displaced the vessels towards the observer in a lateral view, and also widely spaced the Sylvian group. More superficial temporal tumours might obliterate the syphon. Posterior temporal growths would leave the syphon alone. A small tumour might not cause any displacement.

Vascular tumours like angiomas had large looped vessels of supply to them, and they themselves showed as coiled masses of blood-vessels. Meningiomas had normal-sized vessels of supply.

Arteriography was also useful in intracranial aneurysms. These were usually larger than would be expected from the film and filled with blood-clot. They appeared as rounded opacities.

DISCUSSION

Dr. DUNCAN WHITE said that a few years ago he had done some cases, one of which he would show. Originally the external carotid had been clamped—apparently quite unnecessarily. He asked if the liver and spleen of any patients had been examined at a later autopsy. The spleen of patients after hepatolienography had been found sufficiently radio-active to fog a film. Arteriography could not be regarded—at any rate in this country—as an out-patient procedure. In what proportion of cases, he asked, had it given information that could not be obtained by direct radiography or ventriculography? The case he showed represented an intracranial aneurysm diagnosed in this country in January, 1933.

Dr. G. E. VILVANDRÉ said that arteriography involved very highly skilled work on the part of the surgeon, and should be reserved for cases where the diagnosis could not be made by other means. He had been startled at the force used by the young surgeon keen on getting a diagnosis The results of the method were, however, impressive. Aneurysm was an important field in which arteriography was justified; but cerebral tumours in a large proportion of cases could be revealed by direct radiography. A good clinical examination was also essential. He hoped that the paper would not lead small hospitals all over the country to try to produce arteriograms.

Dr. M. H. JUPE agreed that arteriography should be confined to lesions connected with the vessels. Tumours at the base might not give any clue through the vessels. Second pictures gave a better view of meningiomas than early ones.

Dr. G. SIMON mentioned the possibility of failure due to the injection being made too slowly. He took his first film after 10 c.cm. had passed in, and another three seconds later.

Dr. R. MCWHIRTER said he had seen aneurysm successfully shown up. The photograph was usually taken after counting six. A Potter-Bucky diaphragm had considerably improved the results.

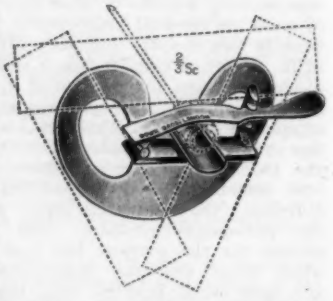
REPLY

Dr. DAVIES, in reply, said that the injections into the common carotid had not had any ill effects on the results. He had never examined the spleen of a patient on whom he had done an arteriogram. He knew of one case where a hepatolienography had had no ill effects seven years later. Only about 12 c.cm. of thorotrast were used in most cases, as the second side was not injected unless it appeared necessary. No arteriography had been carried out in his department unless a ventriculography had already proved of no value. Only about thirty cases had been done altogether.

NEW INVENTIONS

PNEUMOTHORAX NEEDLE-HOLDER

DURING pleural washouts or the treatment of spontaneous pneumothorax it is desirable to keep the needle securely fixed into the chest wall, for, owing to respiratory or muscular movement, it is liable to lateral displacement and may work itself out of the skin.



These defects are entirely overcome by using a small device that consists of a slightly concave base with lateral fenestrations, from the centre of which projects the needle support and spring-catch for instant adjustment or fixing. The holder is secured to the chest wall by strips of adhesive plaster as shown in the illustration.

I recently used a similar instrument in a case of spontaneous pneumothorax with valve action, and the needle was kept in position for ninety-six hours.

This appliance is now being made by Messrs. Down Bros., Ltd., London.

DAVID A. HERD, L.R.C.P. Edin.
Late Assistant Tuberculosis Officer, Stoke-on-Trent.

KENT AND CANTERBURY HOSPITAL.—The erection of the new hospital on a site in the south of Canterbury is progressing, and its total cost, together with the nurses' home, is expected to be about £125,000, with an additional £22,000 for apparatus and equipment. About £102,000 has been collected already.

REVIEWS AND NOTICES OF BOOKS

Urological Roentgenology

By MILEY B. WESSON, M.D., Ex-President American Urological Association; and HOWARD E. RUGGLES, M.D., Roentgenologist to University of California Hospital, St. Luke's Hospital, and Clinical Professor of Roentgenology, Univ. of California Medical School. London: Henry Kimpton. 1937. Pp. 269. 22*s.* 6*d.*

THE publication of a work of this character was suggested as long ago as 1923. Since that time members of the American Urological Association have assisted the editors by sending to them films characteristic of various urological conditions, accompanied by case-histories and operative and post-mortem findings. As a result, Drs. Wesson and Ruggles have been provided with a superb collection of radiograms. Plates selected from this collection form the basis of the present volume. The aim has been to reproduce those most characteristic of the various urological conditions that the practitioner is likely to meet. For this reason attention is paid less to rarities than to commonplace lesions. Perhaps the most interesting chapter in the book is that dealing with renal tuberculosis; the editors are strongly of the opinion that the danger of pyelography in the presence of renal tuberculosis has been over-emphasised, and that urography may be the only means of arriving at a diagnosis in certain cases. They illustrate this by plates showing various stages in the progress of renal tubercle. Another section which is remarkably complete is that which deals with solitary cysts of the kidney. This condition is not as rare as some works would suggest and a study of the characteristic changes should make it possible for anyone unfamiliar with the lesion to diagnose it in a pyelogram.

The text is clear and restrained, just sufficient to allow the reader to interpret the plates. As in all condensed writing, statements appear which may sound dogmatic, such as that "hypertrophy of the psoas muscle may result in a distorted hydronephrotic pelvis," but this is perhaps inevitable in this form of literature. We warmly recommend this work to all who require a comprehensive survey of X rays in urology.

Physiological Principles in Treatment

Seventh edition. By Sir WALTER LANGDON-BROWN and REGINALD HILTON. London: Baillière, Tindall and Cox. 1936. Pp. 308. 10*s.* 6*d.*

"IN the last decade our ideas have undergone fundamental alterations on many points of cardinal importance in physiology. The same period has seen a much wider use of exact scientific methods in clinical work." Those sentences are from the preface not of this but of the first edition of a book, which was written in 1908, as a series of chapters on applied physiology, intended to show the student or the busy practitioner how far physiological facts and principles pointed the way to rational treatment, or provided rationale for treatment long justified by the results of its empirical use. The chapters have changed their content a good deal in successive editions, and in this one their general plan alters a little too. Vitamins now stand alongside the hormones; ketosis comes into the same chapter as diabetes; destructive criticism of such ill-founded theories as those relating to intestinal toxæmia can now, the authors think, be safely curtailed; the section on asthma is extended to include some other allergic manifestations; and a new chapter on the anæmias appears. Through these changes the general purpose of the book remains unaltered. It brings the physiologist to the bedside, and mobilises his contribution, especially his more recent contribution to treatment. It is written for the intelligent practising doctor, not for the specialist or the research worker, and is therefore not overburdened with detail, and not afraid, in places, of confident statement where the expert might prefer to hedge. It is simple, clear, and readable. Medicine has still much to learn from the physiologist's discoveries, and from his manner of thinking; so we share with the authors of this book their hope that in its new form it may continue to serve its useful purpose.

The Operations of Surgery

Eighth edition. By R. P. ROWLANDS, M.S., F.R.C.S., late Surgeon to Guy's Hospital; and PHILIP TURNER, B.Sc., M.S., F.R.C.S., Consulting Surgeon to Guy's Hospital. London: J. and A. Churchill Ltd. Vol. II. 1937. Pp. 998. 36*s.*

FOR the second volume of this splendid text-book of operative surgery, which includes all the surgery of the trunk, the assistance of other writers has been invoked. Mr. W. H. Ogilvie has revised the sections upon spleen, hernia, pancreas, rectum, and surgical preparation. Mr. Ralph Thomson has written on genito-urinary operations, Mr. G. F. Gibberd on pelvic operations in women, and Mr. R. C. Brock on thoracic surgery. There will be some regret at this multiplicity of authorship, for it brings the book into danger of losing just those qualities, especially the feeling that it voiced the mature views and sound judgment of two surgeons, which gave confidence to those who followed its precepts. The reader can no longer open it with the same conviction that he will be adopting a wise course by following its advice. The book is becoming more a compilation of operations and methods without that guidance which has hitherto been the secret of its popularity and success. And even for this purpose it fails, for no one could carry out a Harris's operation for removal of the prostate from the description found on page 729. It shakes our confidence to read of operations for removal of the vesiculæ seminales for tuberculous epididymitis, and to see the many years old diagram depicting the lymphatic spread of carcinoma of the rectum when modern research, both at home and abroad, has made it clear that, when a growth in this situation is removable, there is no downward spread or extension to the ischiorectal fossa and hence no reason for removing the rectum for more than 2–3 cm. below the growth. We cannot find in the book how to deal with a uretero-vaginal fistula which has formed after a Wertheim operation, and we do not think that the assessment of the value of gastrojejunostomy for duodenal ulcer reflects the general view of physicians or surgeons to-day.

Having said these things we gladly testify that there is much of a practical nature and common sense in this book which is difficult to find elsewhere. The descriptions of operations are clear and precise, difficulties are noted, and causes of failure suggested. If the character of the original work has been changed, it is true to say that the book ranks high in surgical literature, and we have no doubt that it will continue to be a standby to junior surgeons in grappling with the many operative problems they meet.

An Introduction to General Practice

By E. KAYE LE FLEMING, M.A., M.D., Chairman of Council, British Medical Association; Direct Representative, General Medical Council; Chairman of the Conference of Local Medical and Panel Committees, 1925–30; Chairman, Representative Body, B.M.A., 1931–34. London: Edward Arnold and Co. 1936. Pp. 150. 5s.

NONE could be better qualified than the author of this book to teach the young doctor starting general practice what he should know about it and in so far as the written word can even take the place of practical experience, Dr. Le Fleming has, in the main, succeeded in his task. Here will be found much shrewd advice upon N.H.I. and contract practice, midwifery, drugs and the chemist, finance, the law, and that unique relationship which exists between the general practitioner and his patients. The essential difference between hospital and private practice is clearly and accurately defined. "In the hospital [the doctor] is omnipotent, the patient a slave who must take the treatment offered and accept it as the best—or leave. In practice the position is reversed. The patient is the master and the doctor a paid adviser. The patient may take as much or as little of the advice offered as he wishes, may question its quality and change his adviser at will." Dr. Le Fleming's frank remarks on professional deportment savour of the last century. We are told that because many patients dislike the smell of tobacco the doctor should not smoke till his day's work is over (whenever that may be), and that in no circumstances should the doctor, until he has removed his overcoat, approach the sick room. There is surely plenty of evidence that the personality of the doctor soon overrides these trivial things and that many a general practitioner may be as well-beloved for his unconventional behaviour as for his skill and kindliness. There is an amusing misprint on page 120 where "waiting-rooms" are described, with a good deal of unconscious truth, as "waiting-tooms."

Man, The Unknown

Popular (second) edition. By ALEXIS CARREL. London: Hamish Hamilton. 1936. Pp. 318. 6s.

IN this book the author attempts, he admits imperfectly, to analyse and interpret man in the light of the relevant facts about him furnished by the various branches of natural science, among which he includes psychology, although denying, perhaps with some truth, that this study is as yet worthy to be called scientific. In attempting so large a task within so small a compass, Dr. Carrel has been compelled to adopt a dogmatic method and to confine himself to making a large number of what he describes as approximately true statements but which are, in fact, very often his own conclusions, many of which are highly provocative and controversial. Indeed, there is material for argument on almost every page. The latter part of the book deals with the remaking of man and attempts somewhat vaguely to synthesise him on sounder lines. Modern industrial conditions, thinks Dr. Carrel, and few will quarrel with him here, crush individuality and standardise mankind to a poor pattern. The remedy, he suggests, lies in a return to a vigorous life of physical hardship and mental self-discipline. "Culture without comfort, beauty without luxury, machines without enslaving factories, science without the worship of matter, would restore to man his intelligence, his moral sense, his virility, and lead him to the summit of his development." Too much useless effort, he maintains, is being expended in trying to strengthen the weak. Our object should be rather to strengthen the strong and so breed a "non-hereditary aristocracy" of mentally and physically superior persons who "could effectively help the weak." But might it not follow that such an aristocracy of the strong would become arrogant and despise the weak without wishing to help them?

Dr. Carrel discriminates sharply, and it may be wondered upon what evidence, between the potentialities of the male and female brain. He is no feminist but believes that woman's primary function is the bearing and rearing of healthy children to which end he would have infant welfare taught in girl's schools. With the problem of the unmarried or sterile woman he wisely refuses to wrestle. The reader may feel that the author's constructive notions suggest a grim, humourless efficiency savouring too much of totalitarianism for the English taste. Nevertheless the book is an important one written in a simple and readable style.

Absorption from the Intestine

By F. VERZAR, Professor of Physiology of the University of Basle, assisted by E. J. MCDOUGALL, Ph.D. London: Longmans, Green and Co., Ltd. 1936. Pp. 294. 21s.

THIS admirable book is the seventh of the monographs on physiology which were for eleven years edited by the late Ernest Starling. The present volume appears with a general preface by Prof. Lovatt Evans, and we welcome the knowledge that the series is to be continued under his ægis. The subject of absorption from the small intestine is of high complexity but great importance to physicians, and not only those who are especially occupied with gastro-enterology, but those whose work brings them in contact with tropical medicine and disorders of the endocrine system will read this volume with interest and profit. Particular reference must be made to the discussion of the absorption of water and the illuminating passages dealing with the influence of the cortical hormone on the absorption of sugars. Prof. Verzar has long enjoyed the reputation of a master of this subject, and this will be enhanced by the present work which is adorned by many illustrations and includes a first-rate bibliography.

Roentgenographic Technique

Second edition. By DARMON ARTELLE RHINEHART, A.M., M.D., F.A.C.R., Professor of Roentgenology and Applied Anatomy, School of Medicine, University of Arkansas. London: Henry Kimpton. 1936. Pp. 431. 28s.

WITH advancing knowledge in radiology, increasing attention is being paid to detail in order to differentiate between lesions giving somewhat similar appearances; the demand for better quality films has resulted in more importance being placed on radiographic technique. This book admirably meets these requirements and the information is supplied in a practical form. It would be safe to say that where difficulty is being experienced, one could almost certainly obtain not only the cause of the error but also the correction of this in the appropriate section. The diploma course in radiography has recently been extended to two years and a book of this type is much required; it will be useful to radiologists who wish to improve the quality of their work and to students of radiography.

THE LANCET

LONDON: SATURDAY, JANUARY 23, 1937

THE FACTORIES BILL

THE long-promised Factories Bill will be laid before Parliament during the early weeks of the session which has just opened. Even that, maybe, is not quite certain, and until the Bill is printed no one outside the departments concerned can do more than guess at the nature of its provisions. But speculation is not without a guide; we may presume that the new Bill will be based upon the provisions of the Bills of 1924 and 1926, which failed to reach the Statute Book. We must not expect any proposals for widespread or profound alterations in factory legislation; but we shall at least find one great boon, namely, a serious and a consistent attempt to simplify and to codify the existing Acts, regulations, and orders in which our present factory legislation is embodied —should we say, entombed? The present confusion in the written word breeds trouble, uncertainty, and irritation both in industry itself and in its medical supervision. On the analogy of previous Bills we are also entitled to predict a concerted effort to raise, and to define at a higher level, some of the basic minima to which a healthy factory must conform. There is an appalling gap between the daily routine of progressive firms and that of competitors who regard as lawful anything that does not actually violate any existing order or regulation. So long as this state of affairs endures, both enlightened employers and well-organised groups of workers are placed at a serious economic disadvantage. We should like to think that the hours of work in unregulated and casual occupations will be brought under control; that overtime will be abolished for all young persons and without exception; and that some limit will be set to the overtime-employment both of men and women in industry. In his annual report for 1935 the chief inspector of factories related, as he had often done before, the serious effects of excessive overtime; every doctor who has practised in an industrial area has railed against this evil. It is perhaps not unreasonable also to hope that minimal standards will be laid down for many, if not for most, of the basic factors in good industrial hygiene—viz., heating, lighting, and ventilation—and that welfare problems will receive the attention they require. Our own profession will anxiously scan the steps proposed to improve and develop the medical and nursing services in industry.

Our readers would do well to obtain two communications which have reached us. The first is entitled The Provisional Programme of the Factories Bill Campaign[1]; the second, issued by the Open Door Council,[2] is simply called The Factories Bill 1937. The former contains a reasoned series of suggestions which it hopes to find embodied within the new Bill; the latter argues cogently for a modern and scientific measure which will give equal and equally good conditions of work to men and to women workers. While they are at it might not these bodies of active citizens also give some attention to the Workmen's Compensation Acts which are in a comparable state of chaos?

[1] 32, Primrose Hill-road, London, N.W.3.

MIXED BACTERIAL MENINGITIS

DOUBLE infections of the meninges are uncommon. Thus among 442 cases of meningitis in which organisms were identified TRIPOLI[3] found only 2 examples: both were fatal, and in both of them *Hæmophilus influenzæ* (Pfeiffer's bacillus) was isolated—once with a staphylococcus and once with a pneumococcus. In the same series there were 221 cases of meningococcal meningitis with a fatality-rate of 65 per cent., and 22 cases of streptococcal meningitis with a fatality-rate of 92 per cent. CADHAM[4] writes that the proportion of deaths in the latter condition is "apparently 97 per cent." and quotes H. GRAY who was able to find only 66 recorded cases of recovery, in 6 of which the patient had scarlet fever.

Though streptococci may, no doubt, reach the meninges via the blood stream or through the perineural sheaths of the olfactory nerves, they usually come from the middle ear or (less often) from the nasal sinuses. In the case he reports on p. 198 Dr. CUNNINGHAM regarded the streptococci as secondary invaders—a finding he considers usual—and his opinion that the left mastoid was their source can scarcely be disputed, since organisms of the same serological type were isolated first from the mastoid antrum and later from the cerebro-spinal fluid. In this case it is clear that although drainage and intensive anti-meningococcal serotherapy might have prevailed against the meningococcus alone, the advent of the hæmolytic streptococcus—against which "anti-streptococcus serum appears to be of little or no value"—made the outlook virtually hopeless. The fatal issue was in any event determined by the streptococcus, but it is interesting, in passing, to note that Dr. CUNNINGHAM employed meningococcal antitoxin, the value of which is not yet established; whereas most clinicians would probably have preferred antibacterial meningococcal serum, especially now that the Lister Institute issues a special serum for use in infections by Group II, the strain usually found in the basal meningitis of infants. CUNNINGHAM rightly emphasises the importance of a complete bacteriological examination of the cerebro-spinal fluid, obtained with rigid aseptic precautions, whenever acute mastoiditis is accompanied by signs of meningitis, and before any operation is attempted. If the meningitis is purely meningococcal, conservative measures, he believes, will suffice for the treatment

[2] 4, Iddesleigh House, Caxton-street, London, S.W.1.
[3] Tripoli, C. J. (1936) *J. Amer. med. Ass.* **106**, 171.
[4] Cadham, F. T.: *Canad. med. Ass. J.* December, 1936, p. 643.

of the mastoiditis; if on the other hand the infection is mixed, antimeningococcal therapy must be combined with immediate operation on the mastoid, but unless there is clinical evidence of an intracranial abscess the membranes of the brain should not be opened.

To-day, fortunately, there is reason to hope that the prognosis of a desperate condition, whether due to meningococci or streptococci or both, may improve with the use of Prontosil or its derivative *p*-aminobenzenesulphonamide. On Dec. 5th we wrote of the imperative duty to employ these preparations not only in puerperal fever but also in other severe forms of streptococcal infection; and since then (Jan. 2nd) Mr. H. PROOM has reported in our columns that *p*-aminobenzenesulphonamide, injected immediately, will protect mice against about a million minimal infecting doses of the meningococci, whether of Group I or Group II. Although, as PROOM remarks, the conditions in established cases of meningococcal meningitis in man are by no means comparable with those following intraperitoneal injection of culture into mice, the results of his experiments suggest—and we would add, demand—clinical trial of the drug, especially as he says that "cerebrospinal fluid taken from rabbits which have received large doses of the drug inhibits the growth of a small inoculum of streptococci, whereas a similar number of streptococci grow freely in the normal fluid." Streptococcal and meningococcal meningitis should thus be added to the list of conditions in which one or other of these new therapeutic weapons should be brought into action. On p. 194 Mr. A. T. FULLER, D.Sc., describes fresh inquiries into how they work.

BURIED TREASURE

WE have already reviewed[1] the work of the Board of Control (Lunacy and Mental Deficiency) as set out in its report for the year 1935. This annual report is an index of progress made during the year and is eagerly scanned by all who are interested in mental care. But the Board issues a supplement to this report in the form of a non-statistical review of what is being done at the mental hospitals. The current volume[2] covers laboratory and other routine, research, clinical odds and ends, and the individual reports by the Board's commissioners of what they found and recommended on their visit to each institution. The perusal of this rather heterogeneous collection is likely to reassure anyone who fears that the comfort and the health of patients are neglected in mental hospitals or that there is little clinical investigation, treatment, or research.

This in itself is no mean service, but unfortunately the book has not been indexed or properly edited, and many interesting communications are buried in it. This applies to some modest or provisional reports such as J. E. Howie's trial of manganese chloride in the treatment of dementia præcox (p. 88), Haslam Fox's use of Evipan-sodium in continuous narcosis (p. 119), Ann Evans's study of an outbreak of dysentery (p. 117), and the similar investigations from fifteen other hospitals, the three accounts of the effect of large doses of atropine sulphate upon post-encephalitic parkinsonism (pp. 86, 95, 175), and Denis Williams's research into the innervation of the cerebral vessels. On some subjects—e.g., the treatment of G.P.I., Sulfosin and Pyrifer therapy in schizophrenia, Somnifaine narcosis, cholesterol estimations—there are many reports, indicating much rather ill-coördinated activity which is less fruitful than it might be; the number of patients observed is in many instances too small to warrant conclusions, and a normal or control series is not mentioned. If such research were planned and carried out in concert by a group of hospitals, instead of sporadically as at present, many a dubious question could be settled or, at any rate, could receive more than a hestitating clinical impression as its answer. Scattered through the Board's report, however, there are also references to work that has been already reported in medical and other scientific journals. Most of this necessarily comes from centres, like the Maudsley Hospital (p. 110), Cardiff City Mental Hospital (p. 78), the Royal Eastern Counties Institution (p. 208), and Stoke Park Colony (p. 211), which have research as one of their chief objects and are appropriately staffed, but there is much evidence of high scientific standards among investigators in institutions less well equipped for the purpose.

The opening summary (p. 9) indicates the range and the chief topics of inquiry. Noteworthy is the volume of research at institutions for the care of mental defect, especially those of the London County Council, in addition to the two (at Colchester and Bristol) already mentioned. There are in the volume also some hitherto unpublished case-reports—e.g., encephalomalacia (p. 138), pontine hæmorrhage (p. 95), suprarenal tumour (p. 140), agranulocytosis (p. 146), progressive lenticular degeneration (p. 158), pellagra (p. 182), herpes zoster (p. 187), and renal glycosuria (p. 188). It may be questioned whether some of these, even if they were more accessibly printed, would serve much purpose in their present brief and incomplete form; like some of the unpublished research here communicated they obviously do not reach the standards exacted by scientific journals. Nevertheless they are of interest to other workers and would benefit by the expert scrutiny and appraisal which publication usually entails. It may be that there is room for a modest clinical journal for psychiatrists which would not be averse from publishing isolated case-reports and inconclusive pieces of research. In any case it is surely undesirable only medium chosen should be an un-indexed official report of which no account is taken in the Cumulative Index, the Zentralblatt or any of the other means of reference that psychiatrists use. Much of the valuable material in this blue-book may remain buried, and it is under this impression that a number of page references is supplied here.

[1] *Lancet*, 1936, 2, 810.

[2] The twenty-second annual report of the Board of Control for the year 1935. Part II. H.M. Stationery Office. 1936. Pp. 526. 7s. 6d.

ANNOTATIONS

MISLEADING LABELS

LABELS are supposed to indicate the nature of the thing labelled, but Dr. James Fenton calls attention[1] to their widespread use to mislead and deceive those who buy labelled food. It is true that the Food and Drugs (Adulteration) Act of 1928 contains provisions intended to protect the public in the matter of labelling of food, but these provisions also contain clauses intended to guard the seller against vexatious prosecution, and this makes them difficult to enforce. It is not easy to prove that a false label is wilfully given knowing it to be false, and it is easy to print on a label matter which, although distinct and legible, is so inconspicuous as not to be noticed by the buyer in the ordinary course of shopping. People, neither stupid nor unusually ignorant, might not realise that "Wood table vinegar" is made by diluting and colouring acetic acid, formed by destructive distillation of wood, or that no wine made in Britain is entitled to be called sherry. A subtle means of avoiding the dangers of the law is by what Dr. Fenton calls the "collateral advertisement," an extravagant puff in the form of newspaper advertisement, handbill, or radio broadcast which creates the desire to buy, whilst the label, to which the customer gives little attention, may be moderate in its claims and legally safe. Dr. Fenton reviews the recent experience of the Royal borough of Kensington in regard to articles sold under misleading descriptions. Jam is an article that is very liable to adulteration and "improvement." Good fruit is not always obtainable at a low price, and various materials such as apple pulp, pectin from various sources, and fruit juice are used to enable jams to be made containing low proportions of their titular fruits. The Food Manufacturers Federation in 1931, after consultation with the Society of Public Analysts, issued standards for two grades of jam, the first quality containing from 45 to 30 per cent. of the named fruit according to its nature and the lower quality 20 per cent., with in this case the declaration on the label "With other fruit juice." The Kensington authorities have found cases where the second quality has been labelled so as to lead the customer to think that it is first quality, although it could be contended that careful reading of the label would show that it was not. Sweets, drugs, wines, infant and invalid foods, and many other classes of food materials are discussed in the article, which shows a widespread attempt to defeat the object of legislation intended to protect the public. It is difficult to suggest remedies. But if specific legislation is ineffective some provision should be made for courts to decide what are equitable dealings as between buyer and seller, regard being had to the ordinary conditions of life; and these do not allow the busy housewife to take her legal adviser with her when shopping or even to study the label on every article she feels like buying, while a row of other customers is waiting to be served.

[1] *Med. Offr*, January, 1937.

SUPPLY OF SPECTACLES

IN ophthalmic clinics there are at present two methods by which patients may obtain glasses. Either an optician appointed by the managing board attends the patients at the place where the eye examination is conducted, or the patient takes a prescription to an outside optician. The Central Bureau of Hospital Information has made an inquiry into the working of the two systems and has tabulated the replies in one of its useful series of memoranda.[1] Certain advantages and disadvantages inherent in both systems may be considered under the heads of optical, personal, and administrative. From the optical point of view, it is obvious that an optician working at a clinic under the direct supervision of an oculist must maintain a recognised standard, or give place to a better man. That such a standard is of vital importance is patent to ophthalmologists, but not so obvious to patients or lay bodies. There are almost as many grades of lenses as there are of cloth; responsible opticians, by long training, know how to select and reject imperfect lenses. The discards are accepted by opticians who have not such training, or who specialise in cheap work. Often there are several ways in which the optical prescription can be dispensed; that most suitable to the patient and his activities can only be selected by a competent optician, sometimes with the collaboration of the oculist. The frames supplied require careful selection; presuming that they are of good workmanship, the optician has to consider the type of work and habits of the wearer before advising any particular style. Often the oculist can be of greater service to the patient if he can have the benefit of suggestions from the optician at the time of his examination. He can see the effect when the glasses are put on and suggest minor alterations. From the patient's standpoint, the knowledge that the work and charges of the optician are under professional supervision should weigh heavily. Patients taking prescriptions away from the clinic have the advantage of being able to choose their own optician, but they run the risk of being persuaded to buy unnecessarily expensive glasses. Some of these points are illustrated in the remarks, printed in the memorandum from one of the hospitals at which an optician attends.

> Under this arrangement the hospital knows precisely what the patients are charged. Previously there were instances of patients taking the ophthalmic surgeon's prescription to an optician and having to pay excessive charges. It was also found that certain patients, having received the advantage of free consultation with the ophthalmic surgeon, purchased a very expensive pair of glasses, and it was felt that this was not right.
>
> In the first instance one or two objections were made by patients who wished to obtain their glasses privately, but it was pointed out that the prescription was the property of the hospital and could only be used for the supply of glasses by the hospital opticians.
>
> The hospital is entirely satisfied with present arrangements and is inviting tenders each year. Preference is given to firms which only supply glasses to the public on a qualified medical officer's prescription.

Obviously it is a good arrangement for the optician to be in attendance at the clinic, but certain administrative difficulties arise. Though an optician may be willing to rent a room from the hospital there may not be one available. Where hospitals are mainly dependent upon local contributions there may be a feeling against the selection of a particular optician, which will result in loss of subscriptions. The difficulty is not diminished when opticians have seats on the board of management. Remarks supplied by hospitals at which an optician does not attend, and given in reply to a questionnaire which will

[1] Memo. No. 107. From the director of the Bureau, 12, Grosvenor-crescent, London, S.W.1. 1½*d*.

be found in the memorandum, may make the position clearer

The ophthalmic surgeons have proposed that an optician should attend at the hospital, but the board have always adhered to the principle that the patients should have free choice of opticians, and no member of the hospital staff is allowed to recommend any particular optician.

The practice of allowing patients attending the ophthalmic department to choose their own optician was adopted at the request of the local optical society.

The prescription is the property of the hospital. It must be used only for the dispensing of glasses in accordance with a scale of charges agreed to and approved by the committee. This practice works very well and enables all opticians to have a portion of the work.

Each year a local firm is selected by tender to supply lenses and frames. Measurements are taken by a member of the hospital staff and the patient selects the frame from specimens kept at the hospital. The prescription, particulars of the frame selected, and measurements are then sent to the firm which obtained the contract. They supply the glasses within one week.

The self-contained clinic may be the ideal solution but not always easy of attainment.

THE PERIPHERAL CIRCULATION IN SURGICAL SHOCK

THE cold clammy skin and greyish pallor symptomatic of shock are evidence of deficient peripheral blood flow. Measurement of the change they cause in the peripheral circulation is therefore an index of the shock-producing properties, for example, of pain, fear, cold, asphyxia, and intestinal obstruction. From the Harvard Medical School comes a study,[1] based on observations on medical students and patients, in which a plethysmograph was used to secure graphic records of the circulation through the hand while the person at the other end of the arm was subjected to various abnormal stimuli. Observations were also made on patients during and after abdominal operations and in the state of collapse produced by intestinal obstruction. Generally speaking, the effect of harmful stimuli is to decrease the peripheral circulation, this effect being due to vasoconstriction evoked through a sympathetic reflex. Withdrawal of the stimulus is followed within a short time by a reactive hyperæmia, and this occurs also after removal of the compression of a tourniquet. By measurement of the circulation in the hand Freeman and his co-workers at Harvard were able to show that the hyperæmia balances the preceding deficiency of blood to the part: oxygen-loss in the tissues is thus rapidly replaced. In patients with surgical shock the reactive stage develops imperfectly or not at all. Vasoconstriction remains, and the result is tissue starvation, which if widespread leads to death. Freeman thinks that the evidence of other observers of surgical shock points to a general reduction of blood flow throughout the peripheral circulation, affecting the splanchnic area and the muscles in the same way as the hand. He regards it as a dangerous exaggeration of the lesser, and primarily physiological reaction, whose aim is to preserve the organism by diversion of the blood to the internal organs.

Circulation in the hand is affected by local stimuli as well as by changes affecting the whole organism, and the plethysmograph records were therefore taken with the hand kept at a constant temperature. Prolonged exposure of the body to cold uniformly reduced the flow through the hand. The method adopted was to have the student lying very lightly clad on a bed for a considerable time, and then for a short time to open the windows wide. Pain was tested by inflating a balloon placed in an ileostomy opening. The actual insertion of the balloon produced no effect, but inflation was soon followed by decreased blood flow in the hand. In another patient, who had a permanent colostomy performed for malignant obstruction, permission had been obtained to insert and inflate the balloon on several occasions. The effect of apprehension was tested by recording the reaction to a proposal to reinsert the balloon. This was as pronounced, though not as prolonged, as reaction to the actual inflation. Asphyxia, produced by inhalation of gases poor in oxygen, much diminished the blood flow through the hand. Manipulation of the intestine during operation also led to a fall in the peripheral blood flow; and in post-operative shock reactive hyperæmia after removal of a tourniquet hardly occurred at all. Improvement after intravenous infusion was, however, quickly shown by the plethysmograph, and as the shock passed off so did the peripheral vasoconstriction. Freeman writes of the fallacy of focusing attention on the blood pressure as an index of the efficiency of the circulation. Blood pressure, he says, is an expression of the amount of fluid in circulation and of the peripheral resistance. A substantial fall of blood pressure was found in some cases in which the general condition was good and in which the peripheral blood flow was also satisfactory, yet in cases of profound shock blood-pressure readings were sometimes near the normal. Adrenaline and ephedrine, it is pointed out, are known to be ineffective in combating surgical shock.

[1] Freeman, N. E., Shaw, J. L., and Snyder, J. C.: *J. clin. Invest.* November, 1936, p. 651.

PRACTISING MIDWIVES

THE Minister of Health has reminded local supervising authorities that their proposals for the service of salaried midwives should be submitted before the end of the present month. We learn from a recent report [1] of the work of the Central Midwives Board that of the 62,064 names on the Midwives Roll at the end of the year only 16,165 were those of women actually in practice as midwives. The number in practice it is true is 300 greater than in the previous year, but this must be set against an increase of 3100 in the number on the Roll. The C.M.B. estimates the proportion of trained midwives who practise as such to be only 26·1 per cent. of the trained women on the Roll and the proportion diminishes each year. The report alludes to the retirement of its chairman, Dr. J. S. Fairbairn, and places on record its admiration of the immense efforts he made to improve the status of midwifery in this country. Mr. Arnold Walker has been appointed by the Midwives Institute to fill the vacancy so occasioned. Apart from the essential figures in the report, interest attaches to some decisions on the etiquette and practice of midwifery given during the year. It is now on record that the midwife, like the doctor, has the right to refuse any case which she does not desire to attend; but this does not apply to cases in which attendance may be demanded on humanitarian grounds or in which the midwife owes duty to some employing authority. Inquiry having been made whether a midwife is expected to attend for at least ten days any case of abortion to which she has been called, the Board remarks that if it is not a booked case, and the

[1] Ministry of Health. Midwives Acts, 1902 to 1926. Report for the year ended March 31st, 1936. H.M. Stationery Office. 1937. Pp. 12. 2*d*.

doctor has been sent for privately by the patient or her friends, a midwife may retire or may remain as a maternity nurse. In reply to another inquiry the Board states that to give ergot at the end of the first stage of labour, save in emergency, is bad practice and such treatment is regarded as definitely outside the midwife's province. The Board sees no objection whatever to the taking by midwives of any steps which may result in the resuscitation of apparently stillborn children. Finally a nurse-midwife employed by a district nursing association is bound to report to the local supervising authority should she be attending septic wounds or any other condition which may raise suspicion of infection.

HOW CHARACTERISTICS ARE TRANSMITTED

To enable us to distinguish between the inherited tendencies and the environmental influences which together mould a developing organism is properly considered one of the most important tasks of biology in its relation to human welfare. In an address delivered on Tuesday last Dr. David Forsyth endeavoured to persuade the Eugenics Society that it is "a false issue" to regard heredity and environment as separable entities; we are wasting our time, he thinks, in analysing living organisms on this assumption. Dr. Forsyth argued that the environment of a mammalian germ cell is the parent's body which begins to exert its effect immediately the germ cell is formed. The parent is however as much the product of inherited as of environmental influences. The surroundings of the germ cell are therefore an "inherited environment," and hence we cannot really distinguish between heredity and environment. But surely Dr. Forsyth lays himself open to the retort that he is using the word heredity in two different senses? To the biologist the inherited constitution of an egg is that which is contained within it at its formation and which, as experiment shows, never deviates from a certain mean in its ultimate expression in spite of environmental changes. An environment is not inherited in a biological sense but only in the sense in which property and traditions, which are external to the organism, can be inherited. For this biologists have unfortunately no separate word. Though organisms certainly inherit (biologically) a tendency to produce a particular type of environment for their germ cells, so far as the latter are concerned it is still purely an environment, in which eggs of different hereditary constitutions can develop without losing their individual characteristics. Dr. Forsyth sought to reinforce his argument by pointing out that soon after development has started the embryo is mainly, and probably entirely, composed of substances derived from the environment, so that there is nothing left of the originally inherited materials. The biologist would reply that the essential things that are inherited are not certain substances but configurations of substances—patterns which persist as inherited characteristics though the original molecules which compose them are completely replaced by others from the environment. These patterns require a certain range of environmental conditions in which they can express themselves and by which they can within limits be modified. Dr. Forsyth extended his desire for unification to the organism itself and its environment. He showed that spatially no hard and fast line can be drawn between an organism and its environment; the two imperceptibly merge into each other and are continually interacting. No doubt this is true, but it cannot prevent us from regarding an organism as a kind of focus around which certain configurations of matter are performing characteristic reactions. This conception is not invalidated by the fact that the reaction system is not sharply demarcated from surrounding matter. It is again these patterns and reactions which are the essence of the thing called organism; the materials taking part in them are derived from the surroundings where these same substances are not behaving in this manner. We have reasonable grounds for differentiating between a single organism and its environment, although, as Dr. Forsyth quite logically concluded, each may be considered in a sense as part of a larger organism comprising all living things and their environments. But while unable to follow Dr. Forsyth in his conclusions, or to find convincing evidence of their practical or theoretical value, we admit that the question of heredity and environment is not as easy to define as many biologists and even medical men are apt to assume, and welcome the stimulus he has given to consider clearly what we mean by these terms.

GASTRIC ACIDITY

ACIDITY of the gastric juice is sometimes confused with its volume, so that the terms hyperacidity and hypersecretion have even been thought synonymous. Such confusion has arisen partly through difficulties in measuring the amount of juice secreted (unmixed with saliva, food, or the contents of the duodenum) and perhaps partly because a highly acid juice is usually found in large, and an achylic juice in very small, quantities. Gradually, however, it has become clear that the hydrochloric acid of the stomach is secreted by the acid cells at a constant fixed concentration and that these cells cannot appreciably vary its strength. The variable factors are the number of cells actually secreting—and therefore the volume of acid put out—and the diluting agents, of which in recent years the alkaline duodenal contents and the neutral or alkaline gastric mucin have been especially studied. Welin and Frisk [1] have lately recorded their estimations of the volume of gastric juice secreted in man, obtained by a technique which excluded saliva and duodenal secretions. Using as their stimulus to gastric secretion an intravenous injection of 20 units of insulin, they found that an increase in acidity and an increased volume of juice followed in about 30–45 minutes; but there was no correlation between the degree of acidity and the rate of secretion—in other words, the rate of secretion might drop while the total acidity remained almost unchanged. In all the cases of duodenal ulcer investigated the rate of secretion was high, the amounts varying between 200 and 500 c.cm. of juice in an hour as compared with 100 to 200 c.cm. an hour in normal subjects. The acidity was found in these experiments to be in inverse relation to the amount of mucus, and the conclusion is drawn that hyper- and hypo-acidity are merely terms representing varying rates of secretion of a juice of fixed (maximal) acid concentration altered by the diluting effect of gastric mucus. This conclusion agrees with views of those who hold that the only means the stomach possesses of reducing its acidity is the secretion of mucus; duodenal regurgitation, they say, plays little or no part in this regulation. Such investigations emphasise the significance of the volume of gastric juice secreted: they suggest that hypersecretion and not hyperacidity is the essential consideration

[1] Welin, G. and Frisk, A. R. (1936) *Acta med. Scand.* **90**, 543.

in conditions like duodenal ulcer, and that the gastric mucin is very important as adsorbent and acid-regulator.

EXAMINE YOUR METHODS

METHOD is a good servant but a bad master, and it is useful to appraise from time to time the value of all routine procedures. This has been attempted for the methods used to control tuberculosis by Dr. Jean Downes in the Milbank Memorial Fund *Quarterly Bulletin* for October, 1936. Dr. Downes believes that to ascertain the effectiveness of our procedures it is necessary precisely to define the objectives of any procedure and to test accomplishment by comparison with other methods or with controls. Ten per cent. of 1386 cases referred by practitioners to the clinic were found to have tuberculosis, but among 1437 children surveyed in the schools no definite case of tuberculosis was discovered, and under 2 per cent. from among 969 referred by the public health nurse. In this country it is only practitioners or school medical officers who refer cases to the local dispensary; the other sources are negligible. Considering the work from another angle, Dr. Downes notes that 2 per cent. of 265 examined because of contact with an infectious case were found to be tuberculous; 14 per cent. of 266 seen because of suggestive symptoms—cough, lassitude, or wasting—were tuberculous, but no cases were found among 177 persons seen because of other complaints, such as back-ache, indigestion, or giddiness. Most instances of infection were found during the investigation of families including a primary focus of infection, next came the results from families where tuberculous meningitis had occurred; no cases were found by the investigation of families in which a child gave a positive tuberculin reaction. To test the value of the increasingly efficient control two series of families were considered, one group of 51 families coming under observation from 1923–30, a later group of 41 families first seen from 1931–35. Of those from 0–19 years tested with tuberculin 74·2 of the earlier group showed infection, but only 51·6 of the later; 70 per cent. of the patients of the earlier group had sanatorium treatment as against 80 per cent. of those seen more recently. Moreover, 44 per cent. of the first group were admitted to institutions within a month and 76 per cent. of the second. Contact examination has also become more comprehensive: 33 per cent. examined as against 51 per cent. This short paper introduces no new therapeutic methods, nor does it suggest new modes of control, but it does suggest to all of us the advisability of adopting from time to time a similar survey.

INDICATIONS FOR OPERATION IN PYLORIC STENOSIS OF INFANTS

THE introduction of eumydrin as an antispasmodic drug may alter the whole outlook of pædiatricians on operation for hypertrophic pyloric stenosis. Meanwhile, however, some observations by Paschlau [1] may be of value. His opinion is that the results would be better than they are in many centres if the indications for operation were more exact, and he recommends preliminary X ray examination after a barium meal. The child is given a small feed to which a teaspoonful of barium emulsion has been added and the stomach is examined immediately after the feed and again at four and eight hours' intervals. Paschlau says that if both the four- and eight-hour examinations show that none of the opaque meal has entered the bowel this is an absolute indication for operation. More usually the stomach has emptied a little; but if after eight hours less than half its contents seem to be in the bowel, then operation is probably the treatment of choice. In another group there appears to be relatively good emptying during the first four hours, but almost no further progress in the next four hours. This, according to Paschlau, means atony of the stomach, and for such cases operation is also strongly recommended. These are the main indications to be gained from the study of the opaque meal. The degree of peristalsis as shown by careful screen examination is said to have prognostic significance; strong peristaltic movements are held to be a good point. Paschlau's other observations on the general state of the child cover ground familiar to British pædiatricians and he is also expressing an opinion current in this country when he writes of the risk of making the infant's condition worse by washing out the stomach with an alkaline solution. Saline only should be used for this purpose. He claims that by a careful study of the indications for operation the mortality-rate from pyloric obstruction in two children's hospitals in Berlin has been reduced to just under 4 per cent.

[1] Paschlau, G. (1936) *Münch. med. Wschr.* 83, 2007.

PERFORATED GASTRIC ULCER

AT a recent discussion in Brussels on the treatment of perforated gastric ulcer, Dr. Robert Leclercq described [1] a case that came under his care at the Hôpital Saint-Pierre in which a large perforated ulcer, situated on the lesser curvature, was so rigid and friable that all attempts at suture failed. Primary gastrectomy was considered to be out of the question as the perforation had taken place twenty hours before operation. Leclercq decided to close the hole by insertion of a hollow sound. The manœuvre was successful. The sound used was a soft Nélaton of number 16 gauge, which was kept closed except for a short time in the morning and evening when it was used to evacuate the gastric contents. The amounts of fluid obtained from the stomach on five successive days directly following operation were (in c.cm.) 600, 600, 500, 800, and 1200. On the sixth day the sound was definitely closed, and on the tenth day it was withdrawn. A gastric fistula did not form and the wound rapidly healed. Three months later the patient was readmitted to hospital. Although his general condition was good he still had symptoms and the radiological examination showed considerable deformity of the stomach. A partial gastrectomy was successfully performed.

The main points raised in discussing Leclercq's case were the certainty with which perforation of the stomach could be diagnosed, and the indications for and against primary gastrectomy in acute perforation. Dr. Leclercq was criticised by Dr. Appelmans because he had made his first incision over the appendix to rule out the possibility of appendicitis. Dr. Appelmans said that a simple radiogram would have shown the presence or absence of air under the diaphragm. If air were present, operation was urgent and the diagnosis of perforation was proved. The absence of air did not rule out the possibility of perforation, but it did mean that immediate operation was not called for, as the perforation was closed off. Dr. Demuylder considered that a small diagnostic incision over the appendix was permissible as it could be used, in case of perforation, for the

[1] *J. Chir., Brux.*, November, 1936, p. 379.

insertion of a suprapubic drain. Dr. Leclercq justified his hesitation in diagnosis by the fact that tenderness was most marked over the appendix area, and that the gas bubble demonstrated in the X ray was so small that he thought it might have been caused by perforation of a gangrenous appendix. Curiously enough, Leclercq seems to have been surprised to find the stomach full, although the retention of the stomach contents is one of the well-established facts in cases of perforation. Dr. Loute said that his practice amongst the miners in the region of Charleroi had given him an extensive experience of perforation in patients coming to hospital in poor physical condition. He considered that the procedure described by Dr. Leclercq was a good one, and he had himself employed it. He was more and more impressed with the number of cases permanently cured by simple suture. Dr. Appelmans spoke strongly in favour of partial gastrectomy as the operation of choice for perforation wherever the condition of the patient justified it. Dr. Leclercq thought that too much weight ought not to be given to the statistics which showed greater success with gastrectomy than with suture. All the critically ill patients were treated by suture, partial gastrectomy being reserved for specially good risks.

CHRONIC RHEUMATIC DISEASES

WE welcomed the first report of the British Committee on Chronic Rheumatic Diseases above all for its attempt to rouse more professional interest in chronic arthritis, and to feed that interest with such grains of wheat as can be winnowed from the chaff of a difficult field. The feeding process is continued in the second annual volume,[1] and the winnowing is careful. Prof. L. S. P. Davidson and Dr. Goldie open it by presenting a reasoned case for regarding all rheumatoid arthritis as "chronic infective arthritis." Their evidence is circumstantial—such points as the more frequent occurrence of antecedent infections and of infected foci in rheumatoid arthritic patients than in controls, and the more frequent findings of streptococcal antibodies in their blood—but it leads them to regard infection, along with sensitisation, and some constitutional predisposition, as the three factors together responsible for the disease. Dr. W. S. C. Copeman presents a dozen cases of his own, and quotes another dozen from the literature, in support of the thesis that some cases of "rheumatoid" arthritis may be tuberculous in origin; in 11 of his 12 cases Prof. Loewenstein, of Vienna, found tubercle bacilli in blood cultures. A most interesting and valuable chapter is a review of recent American researches on diseases of joints and related structures written by Dr. Philip Hench, of the Mayo Clinic, secretary of the American Committee for the Control of Rheumatism; it is a concise and critical survey of the last three or four years, for which workers in this country should be most grateful. There are half a dozen shorter papers in the volume, including a preliminary report by Dr. E. G. L. Bywaters of his researches in Prof. Dodds's laboratory into the metabolism of joint cartilage and synovial membrane, and an account of an attempt by Dr. Philip Ellman and Dr. Sydney Mitchell to assess the psychological features of 40 cases of rheumatoid arthritis and 40 osteo-arthritics. "No cure for rheumatoid arthritis will ever come out of a committee room," Dr. Hench says, "but the efforts of an aggressive committee may well provide the future discoverer of a cure with the inspiration and assistance necessary to achieve his success." In that hope, we trust the efforts of the British Committee will be continued and extended.

[1] Reports on Chronic Rheumatic Diseases, being the Annual Report of the British Committee on Chronic Rheumatic Diseases appointed by the Royal College of Physicians. Edited by C. W. Buckley, M.D., F.R.C.P. Number Two. London: H. K. Lewis and Co., Ltd. 1936. Pp. 140. 12s. 6d.

RADIUM FROM CANADA

THE isolation of radium from the streak of silver-radium ore near the Great Bear Lake in Canada has been progressing rather rapidly. From an official statement recently issued by the Eldorado Gold Mines Limited, who mine, carry, and refine the pitchblende, it seems that unusual problems were posed by the unparalleled richness of the ore in radium. The technical side of production has now been solved by the Department of Mines with the assistance of Mr. L. Pochon who had worked at the Curie laboratories in Paris. By October, 1936, the production of radium had reached two grammes monthly, and the first ounce was completed on Nov. 16th. The capacity of the refinery is expected shortly to be trebled, and orders to the value of more than £800,000 are to be met in the coming year. It is stated that the market price of radium has been halved as a result of developments in Canada, and there is welcome assurance that with increasing success there is no intention of raising the Canadian price to an exorbitant level.

THE BLOOD IN HODGKIN'S DISEASE

HÆMATOLOGISTS do not agree about the peripheral blood picture in Hodgkin's disease, and it is useful to have Wiseman's account [1] of his findings in 31 cases which had not yet been treated by irradiation and in which the diagnosis was confirmed histologically. About half the patients, he says, had a normal total white cell count, and the number did not exceed 10,000 per c.mm. unless the illness was in an advanced stage—all but one of this group having much enlarged abdominal or mediastinal glands. The other cases showed a slightly subnormal count, and there was a definite tendency to neutrophilia. Eosinophilia was sometimes found and Wiseman suggests that it is constant enough to be an aid to diagnosis, though it seemed to bear no relation to the activity of the disease. Approximately nine-tenths of the patients had an absolute lymphocyte count below 1500 per c.mm. (i.e., a lymphopenia), and in none did the number of lymphocytes exceed the normal. On the other hand nearly two-thirds had absolute monocyte counts above 700. All cases sooner or later developed a deficiency both of red cells and of hæmoglobin, associated with an increase of reticulocytes. Wiseman concludes that a blood picture showing a lymphopenia with a high ratio of monocytes to lymphocytes, a neutrophilia, and normal total white count should suggest a diagnosis of Hodgkin's disease. This cellular response, he believes, indicates a non-pyogenic infectious agent as the cause of the disease, and he regards it, perhaps rather dogmatically, as evidence against either a tumour process or a virus. The pronounced lymphopenia in his opinion negatives lymphoid hyperplasia, and he considers that the primitive reticulum cell and monocyte are primarily affected. But his suggestion of an infectious agent of low virulence and non-pyogenic origin, allied on the one hand to the tubercle bacillus and on the other hand to monocytic leukæmia, is not altogether easy to follow. Finally

[1] Wiseman, B. K. (1936) *J. Amer. med. Ass.* **107**, 2016.

Wiseman emphasises the importance of controlling all irradiation therapy by frequent blood counts. It is essential that irradiation should be withheld, whatever the clinical condition of the patient, if the total red cell count and white cell count show rapid deterioration.

SEQUELS TO CHILDBIRTH

IN our first issue of the New Year Dr. Méave Kenny described the state of 100 women who had been treated for puerperal sepsis at the Queen Charlotte's Maternity Hospital isolation block at Hammersmith. Examining them four or five years after their illness she found that no less than 87 were free from any gross lesion of the pelvic organs, such as tubal masses, uterine displacements, or vaginitis. Cervicitis was noted in 5 patients only, and a tubo-ovarian mass in 2, both of whom had previously suffered from pelvic peritonitis. The pelvic findings were indeed so far negative that as the investigation proceeded its interest narrowed upon what was emerging as the most appreciable residuum of the original puerperal infection—namely, sterility. Among the 100 women during four to five years of the active child-bearing period there had been only 5 pregnancies. No contraceptive measures had been used by 26 women, and of the 69 who attempted contraception, only 22 employed methods likely to influence the coming of another pregnancy.

We recall these findings of Dr. Kenny's in order that they may be compared with those recorded in another illuminating article entitled Some Gynæcological Sequelæ of Natural Delivery.[1] Here the author, Dr. Wilfred Shaw, states specifically that he is dealing with natural confinements, not those complicated by puerperal infection, and the basis of his paper is menstrual irregularities, vaginal discharges, and uterine displacements. With great fairness he assesses the importance of these annoying, if not serious, disturbances, and the treatment he outlines is both practical and clear. What is most remarkable in looking at the two papers is that a woman seems less likely to suffer from gynæcological sequelæ after a severe bout of puerperal sepsis than if her delivery and puerperium are uncomplicated. That this may sometimes be true is suggested by Dr. Kenny's observations. The patient with puerperal infection has a long period of enforced rest and good food, whereas the woman who has a "natural delivery" is soon sent home to added cares and restrictions.

HISTOLOGY OF THE DISORDERED BRAIN

HISTOLOGICAL methods of psychiatric research have not been much employed or esteemed in England since sanguine notions about the anatomy of the biogenic psychoses raised hopes that were not fulfilled. This neglect of morbid anatomy, now fortunately being made good, did not obtain elsewhere, as may be recognised from the monograph recently published by Schaffer and Miskolczy from Hungary.[2] Schaffer's views on the common structural features of the heredo-degenerative diseases of the central nervous system have been energetically put forward for a decade, and began with his valuable earlier study of amaurotic familial idiocy. In spite of the strong objections offered by Spielmeyer and others to his assertion that exogenous affections can be differentiated histologically from endogenous ones, he has not flagged and now offers a further exposition of his findings. An elective and exclusive change in the ganglion cells is for him the criterion of a hereditary cerebral anomaly, with its substrate in the neuro-ectodermal hyaloplasm. In detailed reports on schizophrenia, senile dementia, and Pick's and Alzheimer's diseases, his pupil Miskolczy gives a well-documented review of the data that confirm Schaffer's view. What he says of his own observations on schizophrenia is not open to the usual criticism that only the brains of long-standing cases with late secondary changes have been examined; on the contrary, he was able to enjoy the gloomy (but, for histologists, enviable) fruits of an apparently high death-rate among acute schizophrenics within a few months after their admission to hospital. But he is unconvincing in his efforts to rebut the accepted view that the cellular loss in the cortex is an outcome of varied processes, and not itself the primary histological change. The technical discussion of the plaques and other features of senile or presenile dementia which he describes is related to schizophrenia by a final survey of the alleged evidence for a hereditary connexion between senile dementia and dementia præcox; Dr. Miskolczy decides against such a connexion.

A VERSATILE SCHOOL

MEETING on Tuesday last to receive the latest annual report, the governors of the London School of Hygiene and Tropical Medicine found good reason to be pleased. Within a dozen years of its establishment the school has attained a vital position in the medical life of this country, and wields great influence outside England and outside Europe. It is a post-graduate centre for hygiene and tropical medicine; it sets itself to give helpful answers to the innumerable questions that come from investigators, would-be investigators, administrators, and practitioners all over the world; and it ranks high among our institutes of research. The dean's report tells of inquiries of so many kinds that the year's total would seem respectable for a small country rather than a single school. Mostly their subjects are of more immediate importance to the expert than to the profession as a whole—though it is of interest to know, for example, that Mr. A. E. Oxford has isolated a derivative of tyramine (ergot) "which may be of very considerable pharmacological importance"; that Dr. Lucy Wills has shown that the hæmopoietic factor in Marmite is not identical with any of the constituents of the vitamin-B complex (except possibly B_4); that Dr. G. P. Crowden's use of reflecting surfaces to secure comfort in the tropics now extends to the provision of face-masks for furnace-workers and sheets lined with aluminium foil to prevent the chilling of accident victims; and that Dr. Marion Watson has discovered a diet that produces a definite increase in the resistance of mice to infection by *Bacterium aertrycke*. But of all the work described the most striking is certainly the joint researches of the divisions of bacteriology and biochemistry on the isolation of immunologically active chemical substances. We hope to be able to publish some of this work in the near future.

WE regret to learn of the death on Jan. 18th, at Bembridge, Isle of Wight, of Dr. Harold Waterlow Wiltshire, consulting physician to King's College Hospital, at the age of 58.

[1] *Practitioner*, January, 1937, p. 24.

[2] Anatomische Wesensbestimmung der hereditär-organischen Nerven-Geisteskrankheiten. By Karl Schaffer and Desiderius Miskolczy. *Acta med. scand.*, suppl. lxxv. 1936. Pp. 171.

PRINCIPLES OF MEDICAL STATISTICS

IV.—THE VARIABILITY OF OBSERVATIONS

WHEN a series of observations has been tabulated—i.e., put in the form of a frequency distribution—the next step is the calculation from the series of certain values which may be used as descriptions of it, and enable comparisons to be made between one frequency distribution and another. The value most commonly employed is the *mean*, or arithmetic average, and frequently the worker's analysis comes to an end with this calculation. But taken alone the mean is of very limited value, for it can give no information regarding the variability with which the observations are scattered around itself, and that variability (or lack of variability) is an important characteristic of the frequency distribution. As an example Table II shows the frequency distributions of age at death from two causes of death amongst women. The mean, or average, age at death does *not* differ greatly between the two, being 3·72 years for deaths registered as due to diseases of the Fallopian tube and 35·2 years for those attributed to abortion. But both the table and the diagram based upon it (Fig. 5) show that the difference in the variability, or scatter, of the observations round their respective means is very considerable. With diseases of the Fallopian tube the deaths in the year's records are spread over the age-groups 0–5 to 70–75, while deaths from abortion range only between 20–25 and 45–50. As a further description of the frequency distribution we clearly need a measure of its degree of variability round the average. A measure commonly employed in medical (and other) papers is the *range*, as quoted above—i.e., the distance between the smallest and greatest observations.

TABLE II

Frequency distribution of deaths of women in England and Wales, 1934, from (1) *diseases of the Fallopian tube, and* (2) *abortion not returned as septic, according to age.*

Age in years.	Diseases of the Fallopian tube.	Abortion not returned as septic.
0–	1	—
5–	—	—
10–	1	—
15–	7	—
20–	12	6
25–	35	21
30–	42	22
35–	33	19
40–	24	26
45–	27	5
50–	10	—
55–	6	—
60–	5	—
65–	1	—
70–75	2	—
Total ..	206	99

Though this measure is often of considerable interest, it is not very satisfactory as a description of the general variability, since it is based upon only the two extreme observations and ignores the distribution of all the observations within those limits—e.g., the remainder may be evenly spread out over the distance between the mean and the outlying values or be bunched very closely round the mean, leaving the outlying values as very rare events. In publishing observations it is certainly insufficient

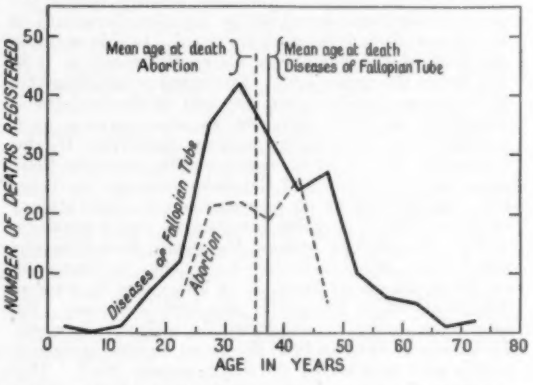


FIG. 5.—Frequency distribution of deaths of women in England and Wales, 1934, from (*a*) diseases of the Fallopian tube, and (*b*) abortion not returned as septic.

to give only the mean and the range; as previously pointed out, the frequency distribution itself should be given—even if no further calculations are made from it.

STANDARD DEVIATION

The further calculation that the statistician invariably makes is of the Standard Deviation, which is a measure of the scatter of the observations around their mean. Put very briefly the development of this particular measure is as follows. Suppose we have the following twenty observations of systolic blood pressure made on twenty different persons:—

TABLE III

Twenty observations of systolic blood pressure.	Deviation of each observation from the mean (mean = 128).	Square of each deviation from the mean.
(*1*)	(*2*)	(*3*)
98	−30	900
160	+32	1024
136	+ 8	64
128	0	0
130	+ 2	4
114	−14	196
123	− 5	25
134	+ 6	36
128	0	0
107	−21	441
123	− 5	25
125	− 3	9
129	+ 1	1
132	+ 4	16
154	+26	676
115	−13	169
126	− 2	4
132	+ 4	16
136	+ 8	64
130	+ 2	4
Sum 2560	0	3674

The mean, or average, blood pressure is the sum of the observations divided by 20 and equals 128. It is obvious from cursory inspection that the variability of the individual values round this mean is

considerable. They range from 98 to 160; on the other hand, a large proportion of the values lie in the narrower range 125–135 (50 per cent. of them). The mean and range are not sufficient to describe the distribution. As a further step we may calculate the amount by which each observation differs, or deviates, from the average as is shown in col. 2. If these differences are added, *taking their sign into account*, the sum must equal nought, for a characteristic of the arithmetic mean, or average, is that the sums of the positive and of the negative deviations of the observations from itself are equal. In this example the sum of the deviations above the mean is +93 and below the mean −93. Two ways of avoiding this difficulty are possible: we may add all the deviations, regardless of their sign, or we may square each deviation so that each becomes positive. If the deviations be added in the example, ignoring their sign, the sum is 186 and the *mean deviation* is, therefore, 186 divided by 20 (the number of observations) or 9·3. This is a valid measure of the variability of the observations around the mean, but it is one which, for reasons involved in the problems of sampling, discussed later, is of less value in general statistical work than the *standard deviation*. To reach the latter the squared deviations are used. Their sum is 3674 so that the mean square deviation is this sum divided by 20 which equals 183·7. The standard deviation is the square root of this value (for having squared the original deviations the reverse step of taking the square root must finally be made) and in this example is, therefore, 13·55.

A large standard deviation shows that the frequency distribution is widely spread out from the mean while a small standard deviation shows that it lies closely concentrated about the mean with little variability between one observation and another. For example, the standard deviation of the widely spread age distribution of deaths attributed to diseases of the Fallopian tube (given in Table II) is 11·3, while of the more concentrated age distribution of deaths attributed to abortion, not returned as septic, it is only 6·8. The frequency distributions themselves clearly show this considerable difference in variability. The standard deviations have the advantage of summarising this difference by measuring the variability of each distribution in a single figure; they also enable us to test, as will be seen subsequently, whether the observed differences between two such means and between two such degrees of variability are more than would be likely to have arisen by chance.

In making a comparison of one standard deviation with another it must, however, be remembered that this criterion of variability is measured in the same units as the original observations. The mean height of a group of school-children may be 48 in. and the standard deviation 6 in.; if the observations were recorded in feet instead of in inches, then the mean would be 4 ft. and the standard deviation 0·5 ft. It follows that it is not possible by a comparison of the standard deviations to say, for instance, that weight is a more variable characteristic than height; the two characteristics are not measured in the same units and the selection of these units—e.g., inches or feet, pounds or kilogrammes—must affect the comparison. In fact it is no more helpful to compare these standard deviations than it is to compare the mean height with the mean weight. Further, a standard deviation of 10 round a mean of 40 must indicate a relatively greater degree of scatter than a standard deviation of 10 round a mean of 400, even though the units of measurements are the same.

COEFFICIENT OF VARIATION

To overcome these difficulties of the comparison of the variabilities of frequency distributions measured in different units or with widely differing means, the Coefficient of Variation is utilised. This coefficient is the standard deviation of the distribution expressed as a percentage of the mean of the distribution—i.e., Coefficient of Variation = (Standard Deviation ÷ Mean) × 100. If the standard deviation is 10 round a mean of 40, then the former value is 25 per cent. of the latter; if the standard deviation is 10 and the mean 400, the former value is 2·5 per cent. of the latter. These percentage values are the coefficients of variation. The original unit of measurement is immaterial for this coefficient, since it enters into both the numerator and the denominator of the fraction above. For instance, with a mean height of 48 in. and a standard deviation of 6 in. the coefficient of variation is $6/48 \times 100 = 12{\cdot}5$ per cent. If the unit of measurement is a foot instead of an inch, the mean height becomes 4 ft., the standard deviation is 0·5 ft. and the coefficient of variation is $0{\cdot}5/4 \times 100 = 12{\cdot}5$ per cent. again. Similarly the coefficient of variation of the blood pressure of Table III is $(13{\cdot}55/128) \times 100 = 10{\cdot}6$.

These measures of variability are just as important characteristics of a series of observations as the measures of position—i.e., the average round which the series is centred. The important step is to "get out of the habit of thinking in terms of the average, and think in terms of the frequency distribution. Unless and until he [the investigator] does this, his conclusions will always be liable to fallacy. If someone states merely that the average of something is so-and-so, it should always be the first mental question of the reader: 'This is all very well, but what is the frequency distribution likely to be? How much are the observations likely to be scattered round that average? And are they likely to be more scattered in the one direction than the other, or symmetrically round the average?' To raise questions of this kind is at least to enforce the limits of the reader's knowledge, and not only to render him more cautious in drawing conclusions, but possibly also to suggest the need for further work" (G. U. Yule: Industrial Health Research Board, Report No. 28, 1924, p. 10).

EXAMPLES OF VARIABILITY

The practical application of the measures of variability may be illustrated by the figures below which are taken from a valuable statistical study of blood pressure in healthy adult males by P. L. McKinlay and A. B. Walker (*Edinb. med. J.* 1935, **42**, 407). In the original the full frequency distributions are set out (see Table below).

The variability of these physiological measurements which is apparently compatible with good health is striking. It leads the authors to conclude that we must hesitate to regard as abnormal any isolated measurements in otherwise apparently fit individuals. Some of the measurements they found are definitely within the limits regarded as pathological and study is necessary to determine whether such large deviations from the "normal" have any unfavourable prognostic significance. It is clear that the mean value alone is a very insecure guide to "normality."

As a further example of the importance of taking note of the variability of observations the

incubation period of a disease may be considered. If the day of exposure to infection is known for a number of persons we can construct a frequency distribution of the durations of time elapsing between exposure to infection and onset of disease as observed clinically. If these durations cover a relatively wide range, say 10–18 days with an average of 13 days, it is obvious that observation or isolation of those who have been exposed to infection for the *average* duration would give no high degree of security. For security we need to know the proportion of persons who develop the disease on the fourteenth, fifteenth, &c., day after exposure; if these proportions are high—i.e., the standard deviation of the distribution is relatively large—isolation must be maintained considerably beyond the *average* incubation time. In such a case the importance of variability is indeed obvious; but there is a tendency for workers to overlook the fact that in *any* series of observations the variability, large or small, is a highly important characteristic.

Means, Standard Deviations, Coefficients of Variation, and the Range of Measurement (based on 566 observations).

—	Mean.	Standard deviation.	Coefficient of variation.[1]	Range.
Age (years)	23·2	4·02	17·31	18– 40
Heart-rate (beats per minute)	77·3	12·83	16·60	46–129
Systolic B.P. (mm.) ..	126·8	13·05	10·13	97–168
Diastolic B.P. (mm.) ..	79·7	9·39	11·78	46–108
Pulse pressure (mm.)	49·1	11·14	22·25	24– 82

In actual practice the calculation of the standard deviation is not usually carried out by the method shown above—i.e., by computing the deviation of each observation from the mean and squaring it. Shorter methods are available both for ungrouped observations (like the twenty measurements of blood pressure in Table III) and for grouped observations (like those in Table II). These methods are described fully in many text-books—e.g., Woods and Russell.

[1] These are the figures given in the original. According to the values of the mean and standard deviation the final coefficient of variation is 22·69. Probably the original calculation was based upon the values to a further number of decimal places.

SYMMETRY

Another characteristic of the frequency distribution is its symmetry or lack of symmetry. With a completely symmetrical distribution the frequency with which observations are recorded at each point on the graph, or within certain values below the mean, is identical with the frequency of observations at the same point, or within the same values, above the mean. With asymmetry the observations are not evenly scattered on either side of the mean but show an excess on one side or within particular values—e.g., with a mean of 50, observations below the mean may not fall below 20 units from that point, the lowest observation recorded being 30, while on the positive side of the mean observations 40 units above the mean may be observed, values of 90 being recorded. The tabulated distribution and, still more, a graph of it will afford an *indication* of this characteristic.

Summary

As descriptions of the frequency distribution of a series of observations certain values are necessary, the most important of which are, usually, the mean and standard deviation. The mean alone is rarely, if ever, sufficient. In statistical work it is necessary to think in terms of the frequency distribution as a whole, taking into account the central position round which it is spread (the mean or average), the variability it displays round that central position (the standard deviation and coefficient of variation), and the symmetry or lack of symmetry with which it is spread round the central position.

A. B. H.

SPECIAL ARTICLES

SOME ASPECTS OF INFANT NUTRITION *

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THE subject of infant nutrition is a wide one, and this article concerns certain aspects only, and in particular the type of material with which we deal in Alder Hey, our methods of investigation and treatment, and the conclusions at which we have arrived as a result of 3½ years' minute observation of 4656 infants under one year. In order to investigate our material we divided the children of this age into weight groups. Of the deaths in children in these groups, 69 per cent. occurred in those who were more than 20 per cent. below average weight. This serves to show what an important part the infant service plays in the work of the hospital, and how necessary is a right understanding of the disorders and nutritional needs of these small patients.

* A paper read to the Maternity and Child Welfare section of the Society of Medical Officers of Health on July 4th, 1936.

They require unremitting care and watchfulness on the part of the nursing staff. They are apt to change quickly for the worse; on the other hand one often observes an almost miraculous change as the result of 24 hours' intensive treatment, so that it is our practice never to give up hope until an infant is actually dead.

Methods of Investigating Faults

If a baby is brought to us with the complaint of any nutritional disturbance—i.e., diarrhœa, vomiting, or failure to gain weight—we invariably approach the problem by assuming that there is (1) something wrong with the feed, (2) something wrong with the baby, or (3) something wrong with both.

THE FEED

We first examine the history carefully, noting the type of feed, the precise amounts given, the addition of sugar and vitamins, and the intervals at which they are given. The child's reaction to each feed is ascertained—that is to say, whether he has gained or not, the type and frequency of the stools, whether vomiting has occurred or not, and if he seems satisfied. A careful analysis is then made to see if the feed

fulfils the rules laid down for the correct feeding of infants, for it is absolutely essential to have rules. The baby who, for any reason, has not the good fortune to be fed by its mother is at a grave disadvantage. The finding of a suitable substitute for this perfect food should exercise all our ingenuity. It should fulfil the following requirements :—

(1) The energy value should be adequate—i.e., 45–50 calories per lb. expected body-weight.

(2) There must be no harmful bacteria.

(3) It must be easily digestible.

(4) There must be enough protein, carbohydrate, mineral salts, water, and vitamins A, B, C, D.

There is enough protein if 1½ oz. cow's milk per lb. body-weight per day is given. As at least this amount is required to meet the calorie requirements we need not calculate the protein content separately, and it can be neglected when milk and water mixtures or dried milks are used. It will be found to be deficient in many of the patent foods and condensed milks. For the carbohydrate there are various rules. For normal babies it is safe to give 1 oz. sugar a day under 3 months, and 1½ oz. a day from 3 months to 6 months. Starch may be added after 6 months. The volume of feed taken should approximate 2½–3 oz. per lb. body-weight per day.

The most usual cause of failure in artificial methods is underfeeding. This may be qualitative or quantitative, or both; or qualitative underfeeding may be combined with quantitative overfeeding—i.e., the calorie value is too low and the volume too large. The baby fails to gain because its stomach is distended. The mother thinks the feed is too strong and makes it more dilute, instead of cutting down the amount of water added. Other errors are too frequent feeds, and feeds too low in protein and too high in sugar, as in condensed milk.

THE BABY

Having noted which symptoms of nutritional disturbance are present—i.e., diarrhœa, vomiting, failure to gain weight—we proceed to look for their cause. A careful physical examination is made. In the osseous system the size of the fontanelle is measured and the skull palpated for cranio-tabes, which we have found to be as common in wasted infants as in rachitic or syphilitic infants. A minute examination is then made of the other systems to find infection, if present. The nasopharynx, the tongue, the buccal mucosa, and the fauces are examined very carefully. The tympanic membranes are inspected by means of an electric auriscope, with specially constructed oval speculum. The heart and lungs are auscultated, and the liver, spleen, and glands palpated. Any skin lesions are noted. The state of the tissues, if there has been recent loss of fluid or of fat—the difference between dehydration and emaciation—is of profound importance in influencing treatment. Finally, congenital abnormalities are noted.

The following special tests are then carried out: intradermal tuberculin injections as a routine; Wassermann reactions, where suggested; hæmoglobin, when anæmia is suspected; urine and stools, routine examinations and culture; and radiography when indicated. Biochemical examinations are performed, such as sugar-tolerance curves on wasting infants, estimation of alkali reserve in severe diarrhœa and vomiting, and blood-urea when we suspect renal failure. Blood calcium and phosphorus are estimated in early rickets and tetany.

Types of Nutritional Disturbance

The following classification is in use :—

(1) Athrepsia: infants more than 40 per cent. below average weight for age.

(2) Hypothrepsia: those who are 20–40 per cent. below average weight.

(3) Dyspepsia.

(4) Fermentative diarrhœa.

(5) Infectious diarrhœa.

(6) Parenteral diarrhœa.

ATHREPSIA AND HYPOTHREPSIA

We have abolished the use of the term marasmus, for we found it was apt to be used loosely to describe any nutritional disturbance, and not merely for children who had wasted. Moreover, it was often regarded as a diagnosis in itself. Athrepsia and hypothrepsia denote definite degrees of underweight, the former being more or less synonymous with the gruesome term "dekomposition" of the German writers and the "atrophy" of English writers. The cause is uncertain. There is often a "constitutional" element present, whatever that may mean. Congenital abnormalities such as heart disease and syphilis are associated with wasting, and there may be achlorhydria. Infection may be a factor, or the child may have been underfed for a long time. Whatever is causing the condition, there is a breakdown in tolerance—i.e., in the ability of the child to digest and assimilate its food. When such a breakdown has occurred, he should be fed on his basal requirements only, that is, about two-thirds of optimum previously outlined. No quantity gain (or gain in pounds and ounces) is likely for some time, but quality gain (or freedom from symptoms) is expected. This quality gain is the period of repair, and is very real and definite. When in spite of his weight line being flat the baby begins to look happy and active, with a pink colour, glossy skin, formed stools, and no vomiting, repair has begun and the feed can be gradually increased to optimum requirements, when he should put on weight. When a baby is not gaining weight one is tempted to raise the calorie value of the feed. He may gain for a day or two but the weight line will become flat for a time and will then drop. This is the so-called paradoxical reaction to food, which occurs when the feed is raised before tolerance is re-established. One has only to experience this a few times to realise how very cautiously the infant's feed should be increased when he has not gained for a considerable time and one suspects a breakdown in tolerance.

In order to give the underweight infant its optimum requirements a high calorie, low volume feed is needed. One finds it impossible to give enough calories without giving too large a volume if milk and water feeds are prescribed. (This refers only to underweight children; milk and water feeds are satisfactory for normal babies.) In this hospital we use lactic acid milk, with the addition of as much as 7½ per cent. of commercial glucose; it is not pure but consists of a mixture of dextrose, maltose, maltodextrin, and dextrin, which is an advantage. The energy value of this feed is 30 calories per ounce. Lactic acid milk is prepared by the addition of lactic acid (B.P.) to whole milk, which leads to the neutralisation of a portion of the buffer substances present, so that when the milk is given the degree of acidity attained in the stomach approximates that when human milk is fed. Owing to this increased acidity one is able to use undiluted milk, and thus a high calorie feed is available. Alternatively, we use

Czerny's butter-flour mixture with added milk, which has 24 calories to the ounce. The mixture is taken well by infants who fail to gain but do not vomit or have loose stools, but it should never be used for vomiting babies. While these infants are reviving their tolerance, subcutaneous salines are given with 5 per cent. glucose, in order to maintain the fluid content of the tissues. In addition to their feeds, vitamins A and D are supplied in the form of Adexolin, 3 drops in each feed. Orange juice is given daily up to 3 teaspoonfuls. Iron in the form of ferric ammonium citrate is given daily in small doses increasing up to 9 grains.

If the infant fails to gain and yet has no symptoms of dyspepsia, as evidenced by diarrhœa or vomiting, we suspect that there is absorption but no assimilation. Sometimes gain in weight can be obtained at this juncture by giving insulin or thyroid. In the absence of any symptoms pointing to thyroid deficiency or of any definite indications from the sugar-tolerance curves, our practice is first to try insulin. If the baby does not gain or even loses weight, we stop its administration and after a few days' rest try thyroid. Insulin is given half an hour before meals; the initial dose is 1 unit, the amount being cautiously increased. The nurses are instructed to watch for signs of hypoglycæmia, and they know what to do should this occur. We have an infant in the hospital who has a diabetic curve, and who has been having, until recently, 20 units of insulin daily, an enormous dose per pound body-weight when compared with adult dosage. He has gained steadily since insulin was started, and recent curves show that he has reacquired his tolerance to sugar. One finds that the liver enlarges during insulin administration, presumably owing to glycogen storage. Whether this is deleterious in the long run or not I cannot say. Thyroid and insulin are the only endocrines which we have used, but we are hoping to try Eucortone in the near future.

There is one more measure that we sometimes adopt in the treatment of athreptic and hypothreptic infants. That is blood transfusion. The blood is injected slowly into the external jugular vein (never into the longitudinal sinus). We have not been greatly impressed with the results of these transfusions.

If the infant fails to improve after all these measures and if he fails to absorb and assimilate his basal requirements he will go downhill and die. There are several ways in which this may happen. He may lose weight and acquire a terminal diarrhœa. This diarrhœa is due to general depression of the function of the body cells and failure to absorb both the fluid administered and the pancreatic and intestinal secretions. It is an inanition diarrhœa, and infants succumbing in this way should not be said to die of gastro-enteritis. It is not an enteritis, for there is no inflammatory condition of the bowel. It is merely a sign of cessation of function and so of absorption. The child may acquire a parenteral infection—nasopharyngitis, otitis media, or pneumonia, which may be accompanied by "parenteral" diarrhœa. Dehydration, intoxication, and death end the scene. He may die from thrombosis of the venous sinuses. This depends on concentration of blood and decrease of blood volume, which is associated with states of malnutrition and dehydration. The blood tends to stagnate in the sinuses and thrombosis occurs. It should stimulate us to be assiduous in giving parenteral fluids while the infant is trying to acquire tolerance again. Clinically the child becomes quiet, the colour is greyish, and there is pyrexia. It reminds one of cerebral hæmorrhage seen in the new-born infant; we have verified several of these cases post mortem. Or, finally, he may develop a terminal uræmia as a result of renal failure. This, however, is usually secondary to dehydration and intoxication.

DYSPEPSIA

We put early feeding errors, such as underfeeding, vomiting due to overfeeding—quantitatively, qualitatively, or both—into the class of dyspepsia. It is the early stage of a breakdown in tolerance.

FERMENTATIVE DIARRHŒA

Overfeeding with carbohydrate causes fermentative diarrhœa, which is seen par excellence in babies fed on condensed milks and other patent foods. Many patent foods do not contain enough fat and protein, being filled up with excess carbohydrate because of its cheapness. As a result of this excess, water is held in the tissues and the baby becomes hydrolabile—"water-baby." These infants on high carbohydrate feeds gain weight on account of this bound water. They lose weight and go downhill very quickly when they acquire an infection, as the water is released from the tissues. The stools in this type are acid, frothy, and frequent. The treatment is to give by mouth only sterile water or Ringer's or half-strength saline for 24 hours. Then small feeds of protein milk are given; we use calcium caseinate added to skim milk. The stools become alkaline, there is putrefaction instead of fermentation. The intestine is rested and a cure usually results. The infant is gradually put on to a suitable feed for discharge.

INFECTIOUS DIARRHŒA

By infectious diarrhœa we mean that in which an organism can be isolated from the stool and held responsible for the disease. It manifests itself clinically by pyrexia accompanied by the passage of loose and frequent stools, which may contain blood and mucus. In some cases, however, blood and mucus are not seen and the disease is not so easy to recognise, especially as it may be complicated by or accompany parenteral symptoms.

If not seen and treated early it leads to dehydration and intestinal intoxication, as does any unchecked diarrhœa. In routine examination of infants' stools, paradysentery bacilli such as the Morgan bacillus are frequently isolated. Some of the infants in whose stools these organisms are found show no nutritional disturbance. It is difficult to know exactly how much importance to attach to these findings.

The *prophylactic* treatment of infectious diarrhœa is of paramount importance. All infants under the age of nine months are cot isolated. Nurses and doctors wear separate gowns for each infant, and wash and disinfect their hands before and after handling them. The feeds are prepared by a special staff in the milk room. A fierce war on flies is waged by means of fly-swatters and fly-papers. Fly screens are attached to the windows of the baby ward. The *curative* treatment is to cut down the food till tolerance is reacquired and to restore body fluid by giving parenteral salines. We have tried Morgan vaccines on a few cases but have not found them to be of much benefit.

"PARENTERAL DIARRHŒA"

The diarrhœa that accompanies parenteral infections such as nasopharyngitis, otitis media, mastoiditis, bronchitis, and pyelitis we term parenteral

diarrhœa. If an infant who is on a well-constructed feed and is gaining weight and looks well, suddenly starts to vomit or has a loose stool, we immediately look for a focus of infection. The mouth, throat, ears, chest, and urine are carefully examined. Most often, a lustreless, tympanic membrane is found. If left alone and examined again the following day it will probably be injected and bulging slightly. If a myringotomy is performed at this stage and pus is obtained, one is often gratified by the immediate cessation of symptoms, followed by gain in weight. Such a happy train of events, however, does not always occur. In a previously healthy infant the outlook is good, but in the undernourished and debilitated, mastoiditis is a frequent sequel to otitis media.

One of the most difficult problems in the treatment of infants is the indications for mastoidectomy. In general, if any infant has had a discharging ear for more than two weeks and shows no signs of improving, mastoidectomy should be considered. But there is another large group of cases in which there are no localising symptoms, when we can only guess at the presence of pus in the mastoid by the severe toxæmia of the patient. This may sound far fetched, but it is true. We were recently impressed by the number of cases of diarrhœa and vomiting which came to post-mortem, in which extensive mastoid disease was discovered. I do not refer to the presence of mucopus in the antrum, which I am aware is often a terminal event, but to cases in which the mastoids were severely infected, and the disease so extensive that the condition could almost be described as osteomyelitis of the petrous portion of the temporal bone. In some of these cases we had suspected ear disease and performed myringotomies. In some, however, there had been no changes in the tympanic membranes which suggested the diagnosis. At this time we tried to decide which cases of diarrhœa were probably due to mastoid disease. Clinically, those in which toxæmia was present, when vomiting was severe, seemed to be most often associated with mastoid disease. In order to try to save some of these infants, we performed several mastoidectomies on babies with severe diarrhœa and vomiting but no definite localising symptoms. The results were interesting. The infants all survived the operation for at least 12 hours. Those in whom the disease was extensive died within 24 hours. Some were no worse but did not improve. In a few pus was not found in the mastoid. But there were several cases in which the results justified the procedure, as from the day following the operation they began to gain steadily, lost their diarrhœa, and ceased to vomit. The results on the whole are therefore discouraging, probably because the operation is not undertaken early enough. I believe that it should be performed far more often. The difficulty is to select the right cases.

Of the other parenteral infections, pyelitis is more likely to cause vomiting than diarrhœa. Any of the other infections, including syphilis and tuberculosis, may lead to diarrhœa.

Treatment

PARENTERAL INFECTIONS

Myringotomies and mastoidectomies have already been dealt with. The rest of the treatment of parenteral infections is mainly prophylactic. In order to prevent the children from acquiring infections in hospital we wear masks over the nose and mouth when attending to them. We are much more dangerous to them than are their parents, because we are in repeated contact with organisms to which we acquire a partial immunity. To the infants we are thus a source of danger as carriers. We do not claim that the masks prevent all possibility of infection passing to the child, but we do think that they serve to remind us not to breathe over him, and we hope that they may dilute the dose of the organisms expired.

Infants who acquire the so-called "gastro-enteritis" in hospital nearly always suffer from a parenteral infection. The sore-throat of the nurse or medical officer is reflected in the stools of the infant. Again and again we have proved this to be true. When an epidemic of loose stools occurs in a baby ward, our practice is to examine and swab the throats of the nurses on the ward and the medical officer. Usually one of them is found to harbour a hæmolytic streptococcus.

Since the wearing of masks these epidemics have fortunately been infrequent. The fact that they do still occur at times serves to remind us that our masks are not infallible. As a further prophylactic measure we instil 2 per cent. ephedrine in oil into the nostrils of all infants, thus shrinking the mucous membrane of the nasal passages and promoting better drainage. Also, we nurse the babies sitting up in the Fowler position. This is because they are at a disadvantage compared with adults in that their Eustachian tubes are short and wide. Thus, when lying supine, nasopharyngeal secretions flow readily into the middle ear, hence the frequency of otitis media in hospitalised babies.

DIARRHŒA AND VOMITING

We have now discussed fermentative, infectious, and parenteral diarrhœas at some length. Whatever the cause of the diarrhœa, if it has persisted long enough, the end-result is the same—severe anhydræmia or, as some prefer to call it, intestinal intoxication. The immediate need is to restore body fluids. If acidosis is present, alkalis should be given; if alkalosis, chlorides; if ketosis, glucose. We can determine the alkali reserve by Van Slyke's method, and administer fluids accordingly. In actual practice, however, we rarely do this. We give, instead, Hartmann's solution, which is so constituted that it combats acidosis, alkalosis, and dehydration.

If vomiting is severe we give intravenous glucose in Hartmann's solution. If vomiting is *not* severe we rely on subcutaneous 5 per cent. glucose in Hartmann's, given eight-hourly to overcome dehydration. Subcutaneous salines are efficient in overcoming dehydration, whereas intravenous glucose is a valuable method of dealing with ketosis. Hypertonic injections of glucose intravenously can with advantage be combined with the intraperitoneal injection of Ringer's or normal saline, or Hartmann's solution. The hypertonic glucose draws the weaker solution from the peritoneal cavity into the blood stream, thus serving to dilute the toxins and promote diuresis.

In some cases where diarrhœa is severe and incessant continuous intravenous fluids are given. A blunt needle is tied into the saphenous vein. Fluid is allowed to drip in at the rate of 1–2 c.cm. per lb. body-weight per hour.

We use no drugs in the treatment of diarrhœa with the exception of kaolin (aluminium silicate), which is said to adsorb toxins and remove them in the stools. It is valuable in the early stages of diarrhœa.

For children over one who are not needing parenteral fluids we give raw sieved apples four-hourly. We have been favourably impressed with this treatment. The children take the apple readily and are more contented than when they are fed on an entirely fluid diet. Apple is filling, and they acquire a comforting sense of repletion.

THE DEFICIENCY DISEASES

I do not propose to deal exhaustively with rickets, scurvy, and nutritional anæmia, but to make a few remarks on the treatment of rickets. Most cases of rickets heal readily with the mercury-vapour lamp and cod-liver oil, of which it is important to give enough or healing is long delayed; 3000 international units are needed daily to cure and 1500 units to prevent rickets. That is to say, 1500 units daily should be taken by the end of the first year. This amount is contained in 1·5 c.cm. Radiostoleum, 1·5 c.cm. Adexolin, or 3–4½ drachms of cod-liver oil, depending on the standard used. Twice these doses are needed if the child actually has rickets. If the cod-liver oil emulsion is used very much larger doses are necessary. As we find the amount of cod-liver oil required daily is more than a great number of children could tolerate we reinforce it in this hospital with radiostoleum. We add 1 c.cm. of radiostoleum to 1 oz. of cod-liver oil. By this means the vitamin content of the oil is raised so that 2 drachms daily is a prophylactic, and 4 drachms daily a therapeutic, dose.

AFTER-CARE

So much for our method of treatment in hospital. When an infant is gaining weight on a suitable feed, that is one which fulfils the requirements already laid down, it is discharged as cured. The mother is given precise instructions in the milk room as to the preparation of the food. The maternity and child welfare service is notified of the discharge and the health visitor visits the child in its home, and sends a report back to the hospital on the condition of the infant and on the parents' capacity to carry out instructions. These reports are extremely valuable. The children are referred to clinics and are asked to attend the after-care clinic in the hospital at least once, so that we can see whether or not they have progressed since discharge.

Conclusion

An attempt has been made to outline the methods of investigation and treatment of the infants at Alder Hey. I cannot help feeling that the treatment of infants in hospital is not satisfactory. They are more than metabolic problems. Apart from the risks they run in catching infections, they require a normal home environment—i.e., the caresses and attentions of their parents and the presence of brothers and sisters.

T. Brenneman of Chicago says (*Amer. J. Dis. Child.* 1930, **40**, 12):—

> "The herding of infants in separate wards where the individualisation and mothering of the home are wanting, where exposure to infection of the respiratory tract leads to more institutional casualties than one can contemplate with serenity of mind and of heart, is fraught with such danger that one wonders if it were not better to abolish them altogether. . . . In our hospital we have tried to meet the situation both by not admitting the type of case that is still commonly admitted and by discharging others at the earliest possible moment. The baby clinic department and the out-patient department has thus grown at the expense of the infant ward."

I heartily concur with every word.

I should like to finish these remarks with a plea for the encouragement of breast-feeding. Breast-fed infants rarely fall victims to the maladies outlined in this paper. If breast-feeding were more universal the baby wards would be emptier, and fewer infants would be called upon to brave the dangers of hospitalisation. The breast-fed infant rarely succumbs to infection.

I am indebted to Dr. W. E. Crosbie for permission to publish this paper and for much helpful criticism.

HOSPITAL PLANNING AND DEVELOPMENT

"A serious responsibility rests upon all who build hospitals. They must not forget how long-lasting are mistakes which are embodied in steel and concrete. A hospital in its every section must be planned for its work. There is reason to fear that, even to-day, hospitals are being built which do not fully conform to that basic principle."

This passage appears in an interesting section on hospital planning and development included in Sir Frederick Menzies's latest report on general and special hospitals.[1] The London County Council have determined to standardise the dimensions of certain types of sick ward to be erected in future at the general hospitals under their control—viz., single-bedded wards and large wards "of the type which must still be considered the normal type, that is to say, those in which the beds are placed on either side of the ward and project at right angles from the side walls." The standards decided upon are as follows:—

Single-bedded Wards	
Minimum floor dimensions	11 ft. by 10 ft.
Minimum height	10 ft.
Large Wards	
(*a*) Wall space per bed: Acute wards ..	8 ft.
Chronic wards ..	7 ft. (8 ft. if offensive cases are treated).
Cot wards ..	7 ft.
(*b*) Width of wards of all types	26 ft.
(*c*) Height	11 ft. (up to a length of 50 ft.). 12 ft. (when the length exceeds 50 ft.).

These dimensions afford rather more than 100 sq. ft. of floor area per bed for the acutely ill and 90 sq. ft. for chronics. The longitudinal and lateral standards are justified not only on grounds of comfort and well-being of the patients but also by the convenience of the staff and the efficiency of their work. More than once it is emphasised that they have not been reached from theoretical considerations but are based on practical experience, and we are reminded that that eminently practical authority, Florence Nightingale, prescribed them in 1863, although subsequent experts on hospital design have frequently departed from them. On the financial side it is mentioned that each additional foot of ward-width costs only £1 per bed, but it is hardly a just comparison to place against this figure, as the report does, a reasonable total cost of £800 per bed for initial hospital construction. The latter figure includes all buildings such as staff quarters, laundry, engine-house, kitchen, &c. The real additional expense of added width would be better stated in relation to the estimated average

[1] London County Council. Annual Report of the Council, 1935. Vol. IV (Part 1). Public Health—General and Special Hospitals. London: P. S. King and Son, Ltd. 2*s.* 6*d.*

cost per bed of a ward-block only. Even then it would represent a relatively small proportion.

Most administrators of hospitals will probably agree with standards providing 8 ft. bed-centres and 26 ft. ward-width, although it is doubtful if a modernly furnished and equipped ward need exceed 24 ft. While wards intended for infants and young children may quite conveniently be narrower, it is probably wise to provide for the contingency that these wards may come to be used for adults. For the same reason, and because the dangers of droplet infection are far greater in children's wards, there may be some doubt as to whether there is justification for reducing the wall space in their case from 8 to 7 ft. Window spacing in this type of ward conforms to bed spacing and stereotypes the arrangement of the beds, whether they are used for adults or children. The standards of height laid down are also generally accepted in modern hospital construction. As Sir Frederick says, variations in height affect building costs to the greatest extent. The arguments used in reference to the condition of air in a ward would, however, if applied to the patients' comfort and well-being, hardly support the sweeping and rather dangerous statement that "appearance is the single consideration which should govern the height of wards." This is very nearly true, but not quite.

BED ALIGNMENT

It is not clear from the report whether Sir Frederick accepts the view that the type of ward which he describes as "normal" is also the best. Probably it has been thought that wards of a design common in other countries, but rarely seen in our general hospitals, are still at too experimental a stage to permit of standardised dimensions. If, on the other hand, the L.C.C. propose to adhere to the orthodox British type of ward, the reference, quoted above, to mistakes embodied in the modern structural materials "steel and concrete" may be prophetic. Apparently, however, the L.C.C. are themselves prepared to experiment, for a scheme for a large extension of the North-Eastern Hospital (for infectious diseases) which was described in a report of the hospitals and medical services committee, dated Oct. 18th, 1934, included eight ward blocks, each with two wards of 20 beds divided into bays of four beds each by dwarf glazed screens. Each of these wards is T-shaped with sun verandahs at the ends. We understand that the beds in these new wards are arranged parallel to the external walls, except at the angles where the peculiar design renders this impossible.

The opening of the new Southend General Hospital in 1932 aroused interest in this type of bed-alignment. As will be seen from the accompanying photograph (Fig. 1) the window-spaces have been so arranged that the beds may be set parallel to the wall in pairs, the occupants facing one another, and separated by partially glazed screens from the next group. Each bed or each pair can be completely screened off from the rest of the ward and the patients have a view from their windows without glare. Obviously such a ward can carry rather fewer beds per unit of length, if working space is left between the feet of opposite beds, but it is reasonable to suppose that the ward may be made somewhat narrower than usual without causing inconvenience. A similar bed-arrangement has been adopted in the New Sussex Hospital, Brighton. Middlesex Hospital has also wards of this kind for special departments, and apparently has contemplated applying the idea to double-width wards, presumably with two rows of beds on each side.

FOR AND AGAINST THE NEW STYLE

In the first design of the Birmingham Hospital Centre this modern tendency was followed, but the board, after very careful consideration, reverted to the old style. The arguments for and against the two systems are briefly as follows. In the "normal" ward a nurse has an uninterrupted view of the faces and demeanour of every patient. Moreover, the maximum concentration of patients is permitted, with the minimum travelling distance for the staff and the longest striking distance of droplet infection for patients facing each other. It is maintained by some hospital administrators that patients like a full view of all that is going on in the wards. Wards of this type, being lighted on both sides, and also often at one end, are bright. Their structure is simple, the spaces between windows and beds being uniform. On the other hand, the advocates of a different arrangement plead that the complete publicity of the open ward is objectionable to many patients, and that the untoward events which occur openly in such wards are psychologically bad for the other inmates. The glare from the windows

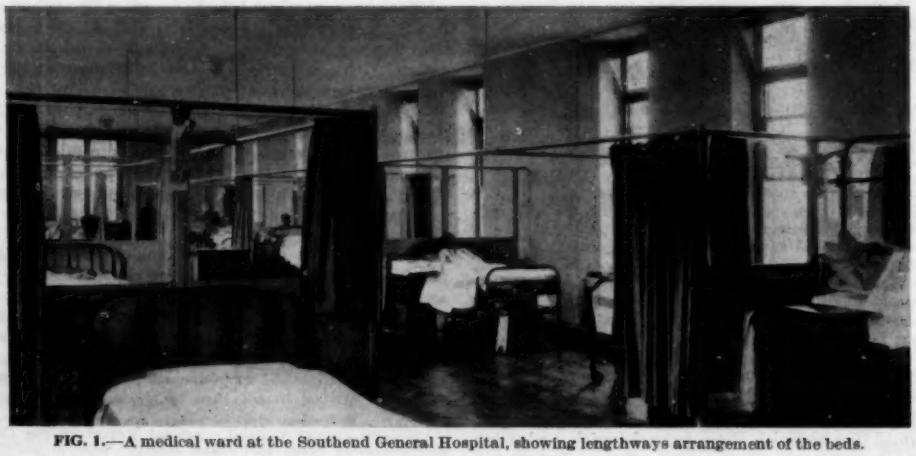


FIG. 1.—A medical ward at the Southend General Hospital, showing lengthways arrangement of the beds.

[Photograph by Wellaka

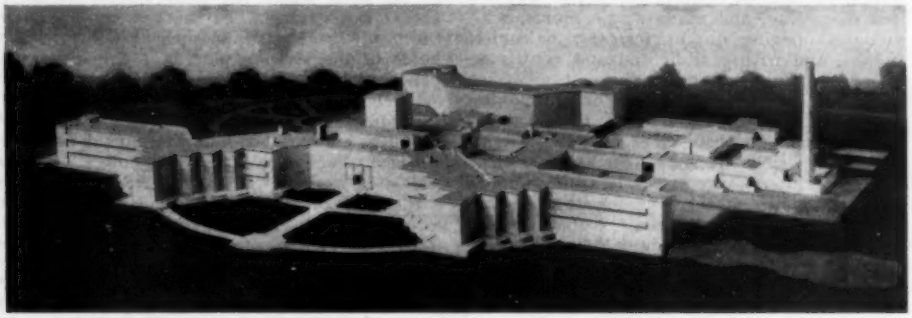


FIG. 2.—Model of the Sully Tuberculosis Hospital, Cardiff, by the architects, Messrs. William A. Pite, Son, and Fairweather.

Photograph by Daymond & Son

on the other side which each patient faces have been proved, they say, to cause harmful effects, such as headaches. Lengthwise arrangement of the beds is claimed to obviate glare, and at the same time to afford the patient a view from the window alongside of which his bed is set. Partitions at the head of each facing pair of beds, with, in addition, curtains suspended from rails round each bed, provide an opportunity for varying degrees of privacy, which the supporters of the arrangement believe there is plenty of evidence the patients desire. Radiators, also, can be so placed that heat is not most intense at the patients' heads where it is least wanted, and warmth and ventilation in winter or during excessive summer heat are more easily adjusted. It is said that no patient who has been treated in such a ward is happy if he is transferred to one of the old style. Critics reply that a nurse has difficulty in supervising the patients whom she cannot readily see, that she and other members of the staff have further to walk per bed for each item of service, that there is less room for groups of students to surround a bed in teaching hospitals, that the desire for privacy is exaggerated and that, in any case, it is more difficult to secure that privacy at crucial times, since, in ordinarily planned hospitals, the patient would be overlooked from the windows of adjacent blocks.

Dr. William Evans, who had experience of the new style at Southend, and who is definitely in favour of it, permits us to use some comments he has made in a private communication. As to supervision, he is assured by the sister of a medical ward that, after three years' experience, she would never now desire to revert to the old arrangement. When it was suggested that there was need for more accommodation, the nurses were anxious that it should not be obtained by conversion to the orthodox arrangement. There is no inconvenience in teaching students, since the bed is not contiguous to the wall, as our illustration shows (incidentally, it may be said that the number of students who can profit from any sort of bedside teaching at one time is obviously limited). When the patient is screened off he is still in a well-lighted compartment, comparable to a private room. There is less disturbance of sleep at night by the unavoidable activities in other parts of the ward. As the patient has at no time more than four patients within view, it is easy to protect him from the distress or gloom which results from seeing others who are gravely ill, a psychical factor which Dr. Evans regards as important. In the same category is the outlook on the external world which the patient has from his own window. From the surgeon's point of view, Sir William Wheeler regards the new arrangement of beds as better for everybody for it makes it possible at any time to convert the space occupied by a patient into a miniature ward, whether for detailed examination for recovery from an anæsthetic, or for critical illness. But he admits that the usual arrangement of beds is more economical of space.

The likes and dislikes of patients are difficult to assess. Few of them have experience of more than one kind of hospital ward, and if they are contented or dissatisfied the cause is just as likely to be temperamental as founded on reason. A sociable person who is not too ill may like the bustle of an open ward, but the sensitive, who may feel most the lack of privacy, are probably least likely to open their minds. Careful comparisons of the patients' reactions under the two systems by such unprejudiced observers as Dr. Evans is required to settle this point, but we may also ask how we should feel about it if we ourselves were unprivileged patients. Long-suffering silence is not necessarily evidence of lack of preference. Nurses, too, readily accommodate themselves to conditions and, if they are not temperamentally fault-finders, are apt to think that system best to which they have become accustomed. There would seem to be little advantage in an outlook from a window which is circumscribed by neighbouring blocks, or perhaps only their roofs. On the other hand, the objection to being overlooked by other windows is not insurmountable; curtains on windows would be a small extension of the curtains round the beds and are essential to privacy. Indeed, if the normal healthy person prefers to sleep in a darkened room, it is difficult to see why a patient should be wakened by the early summer light in our barrack-like hospitals.

THE LESSONS OF TUBERCULOSIS

The whole question of hospital situation, planning, and internal arrangement requires study by the medical and nursing professions. There is evidence that architects are eager to experiment with ideas derived from foreign experience. Professional caution, and perhaps superiority, on our part tends to hold them back. And yet we have plenty of variety in construction in our own country if we know where to look for it. Since 1912 sanatoria and hospitals for tuberculosis have sprung up like mushrooms. Their design was originally derived from foreign sources, but has been modified to meet the exigencies of our climate. Essentially they are built to catch the sun, the patients' quarters facing south, with

small wards, sometimes subdivided in the way we have been discussing, and many single rooms, with wide windows opening on to terraces, balconies, or verandahs, and with well-lighted and ventilated passages joining the wards on their north side (see Fig. 2). Ready and noiseless means of summoning aid are provided, and, it may be noted, these institutions are not without their emergencies. To an increasing extent their patients are the subject of major surgical interference. Nearly all the women and most of the men are said to prefer single rooms, when they get accustomed to them. Nurses trained in "normal" hospitals readily adapt themselves and find no serious administrative difficulty. It is true that their design would be wasted in congested urban sites, for outlook is one of their features, but there are few nowadays who would choose such sites for new hospitals. There need be no limit, within the range of structural practicability, to their height, communication by elevator taking the place of the long march from ward to ward which a large, openly spread hospital of the old style entails. Those who are planning new hospitals might profitably study the experience of the larger tuberculosis authorities. They would find answers to many of their doubts and queries. There is much more involved than mere bed-alignment.

MEDICINE AND THE LAW

Rhabdomancy

EARLIER in the present month the newspapers reported that the services of a water diviner had been employed in the attempt to discover a little girl, aged ten, who was missing from her home at Newark. The diviner carried with him a sock worn by the child. It was stated that, at one point in his perambulation of the ground, the diviner felt fairly confident there must be something belonging to the girl at that spot.

Amid all the controversy between superstition and rationalism, water divining remains a reputable profession in many parts of the country. Did not Moses strike the rock with his staff and did not the waters gush forth? If the problem is not so much to indicate the presence of subterranean water as to find it available at a reasonable depth, diviners' rods continue to point to the site of prospective wells and the back-breaking labour of well-sinking is undertaken more readily on that account. The detection, however, of buried treasure, missing bodies, and elusive criminals by means of the divining rod is an extension which folklorists can study without the necessity of firm belief. Sir George Hill's recent book on "Treasure Trove" mentions the condemnation in Norwich Cathedral in the fifteenth century of a woman who brought a holly-wand (given to her daughter by a fairy) to be blessed by the local curate with a view to its being used for finding treasure. Baring Gould, in his "Curious Myths of the Middle Ages," recounts the career of Jacques Aimar, a French diviner who could track down criminals. So long as the man practised in the provinces, he was almost infallible; when his fame caused him to be brought to Paris, his gifts deserted him. There is a parallel to the recent incident at Newark in the use of the divining rod by a volunteer in the search, not long ago, for the son of a well-known artist who was drowned in Cornwall. The rod was used on the sea in a boat and was understood to offer indications of the cove where the body should be found. In the United States when the country was stirred by the tragedy of the kidnapped Lindbergh baby, all kinds of magic were placed at the disposal of the police. The chief of the New Jersey police force let it be known that, if any two seers agreed upon the same clue, the whole of the police resources would be employed in following up the line indicated. No such coincidence came to his notice, but a medium presented himself who claimed special properties for a small instrument consisting of a lead weight on a rotating arm. Some incredulous police troopers were sent with him to pursue whatever course the instrument advised. After frequent consultations at cross-roads the chase led them confidently to a particular house where the baby would be found. It turned out to be the home of residents of unimpeachable respectability. In moments of desperate anxiety it is natural to try any device and to pray for a miracle. It certainly borders on the miraculous if a water diviner should possess the qualities of a bloodhound.

VIENNA

(FROM OUR OWN CORRESPONDENT)

HEALTH INSURANCE

A PROLONGED and stubborn controversy between the medical profession and the krankenkassen—the health insurance societies—has at last ended satisfactorily for both parties. Ever since the upheaval in 1934, when the institutions of the social-democratic party—of which the krankenkassen formed an important part—were overthrown, practitioners working under the new "social insurance law" have never known how long they could count upon a livelihood from this source. Appointments were only temporary and had to be renewed every three or four months, as the economic situation of the krankenkassen was very unsettled and the financial effect of the new organisation had to be watched before any definite agreement could be drafted. One of the chief complaints of the profession was that a fifth of the total income of the krankenkassen—which are united in one large union called the Arbeitsgemeinschaft—was devoted to medical fees and the cost of medicines. That meant that the more medicines the doctors prescribed the less money was available for their fees. In addition they received each month only a part of their bills, and only at the end of the year the balance would be paid after deducting the costs of medicines; and naturally the doctors vehemently objected to this arrangement. Now, as has just been reported, the representatives agreed that a quarter of the total takings of the krankenkassen will go to cover the expenses of medical fees and medicines. All reasonable remedies will be permitted, so that doctors may have a free choice. If a medical man is found to have been too extravagant in prescribing, he will have to refund the excess, or to have his fees reduced by that sum, so that he personally will suffer and not, as hitherto, the whole profession. A governing committee formed by an equal number of medical men and krankenkassen officials, and presided over by a government delegate, will control the economic questions.

The problems involved in this matter are rather important because, as the Minister for Social Welfare pointed out in his recent report, the social insurance

law affects about 2,000,000 people, 30 per cent. of the Austrian population, and deals with about £17,000,000 a year in contributions towards sickness benefit, old age pensions, and unemployment provision. In 1935 the krankenkassen spent 20 per cent. of its income in doctors fees, 9·5 per cent. in medicines, 15 per cent. on hospitalisation, 28 per cent. for sick pay, and 14·5 per cent. for administration. A total of 331,000 members are insured against sickness, to which must be added 230,000 relatives who are also entitled to reduced fees. Further statistics show that besides the total of 2,000,000 persons compulsorily insured against sickness there are 416,000 full-time workers and 925,000 half-time workers insured against accidents, while 210,000 are insured against invalidity, 743,000 against unemployment, and 871,500 in the old age pension.

COMING MEDICAL CONGRESSES IN VIENNA

This year a number of important medical meetings will be held in the capital. The centenary of the Gesellschaft der Aerzte in May will be celebrated by a series of social functions and of lectures delivered by the leading scientists of Central Europe. In July the International Congress on Short-waves will be held here, with d'Arsonval and Marconi among its honorary presidents. Its transactions will comprise three groups: Physics (including chemistry and technical physics), Biology, and Medicine. In September the customary congress of alpine practitioners (the thirteenth) will be held, partly in Salzburg, partly in Vienna. In addition the preparations for the International Surgical Congress, which will take place in Vienna in 1938, are now being made, including those for a splendid surgical exhibition. The committee of this convention is already very busy with the organisation of this meeting, which is expected to be the largest of its kind.

PROF. HAJEK'S SEVENTY-FIFTH BIRTHDAY

A short time ago Prof. Marcus Hajek, the rhinolaryngologist, celebrated his seventy-fifth birthday. Although he had asked that no notice should be taken of the event, his friends and pupils and the learned societies availed themselves of the opportunity to pay homage to his splendid qualities. In one of the contributions dealing with his life-history it was revealed how Hajek, brought up in bitter poverty in the country, had to work hard for his living from the age of 14. He soon came to Vienna, where he originally intended to study mathematics and natural history. But he was advised to turn to medicine if he wanted to earn his living. He did so, and as a result became a world-famous authority on the nose and throat, though his whole career had been paved with obstacles and difficulties. When he resigned his office as chief of the nose and throat clinic in Vienna after attaining the age limit of 70 years, he turned to his old favourite occupation of mathematics and physics, and in the recent celebration said to a friend who was congratulating him: "That's all very well, but if I had been able to study what I wanted to when a boy, I would surely have really achieved something, and would not have become a mere laryngologist."

ACCIDENTS IN VIENNA

In the annual report for 1935 of the Voluntary First-Aid Society some interesting items are worth reading. Thus we find that 26,134 persons (about 72 a day) applied for first aid, of which about 60 per cent. had been injured, the rest being due to sudden illness. Of the total, 14,449 were males, 10,069 females, and 1616 children. There were 3111 traffic accidents that needed attention, 1685 being occupational accidents, 725 due to athletics or sports, 428 to electric shock or to caustic irritants, 618 to alcoholic intoxication, and 134 persons were bitten by animals. In 2055 instances suicide was attempted or committed. The society's ambulances were called out over 15,000 times, or 41 times a day. The expenditure was about £16,000, help being rendered to the public free of charge.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

ABERDEEN AND THE TREATMENT OF RHEUMATISM

LAST November Prof. Stanley Davidson laid some of the facts about rheumatism before the Aberdeen Business and Professional Club. He told them that a sixth of the industrial invalidity of Great Britain is due to rheumatic diseases and the probable cost to the country is about £20,000,000 a year. Rheumatic diseases, he said, might to-day be described as Public Health Enemy No. 1, and action against them was urgently required. Among the measures he recommended were the establishment of special centres for treatment, compulsory notification, the appointment of a medical staff specially trained for the work, and the setting up of organisations in every area to arrange that young adults with damaged hearts should find sheltered occupations. As Sir George Newman had said in his report to the Minister of Health in 1928, there is a need not only for diagnostic units but for special arthritis units in charge of full-time specialists. Prof. Davidson suggested that the specialist should be a member of the staff of the medical officer of health and be called "assistant medical officer for rheumatism," the post being similar to that established for tuberculosis. Nothing however had yet been done by the Ministry of Health to carry out these recommendations—made in 1928—and he proposed that Aberdeen should take the lead in Scotland in carrying them out. A special opportunity was provided by the fact that Aberdeen was on the point of having a large hospital more or less empty, and not required for any other than a medical purpose. When the patients were removed from Woolmanhill to the new infirmary at Forresterhill ample accommodation would be available, and the cost of reconstruction would be low. The fall by 50 per cent. in the incidence of tuberculosis in the last twenty-five years should have released money that might be used to finance the rheumatic campaign with little or no additional expense to the public health service.

Prof. Davidson's suggestions received support at a meeting of the Aberdeen and district branch of the British Medical Association on Dec. 18th, when the meeting was addressed by Dr. W. S. C. Copeman, physician to the British Red Cross Clinic for Rheumatism, London. Dr. Copeman spoke of the economic importance of rheumatism to the country, the financial difficulty found by many approved societies in assisting the rheumatic patient, and the fact that societies able to make such provision often did not know where to send patients for treatment. He emphasised the need for concentrating on industrial areas and outlined the essentials for an effective centre, illustrating by lantern slides the equipment

and methods used in the British Red Cross Clinic in London. The aim was to allow the patients to continue with their daily work as far as possible, one of the most important points in the treatment of patients of the working class.

Among subsequent speakers who supported the establishment of a centre in Aberdeen were the chairman (Dr. George Mitchell of Insch), Prof. David Campbell of the chair of materia medica in the University, and Dr. Thomas Fraser. It is to be hoped that this excellent proposal will be carried into effect.

GLASGOW CORPORATION AND THE VOLUNTARY HOSPITALS

At a meeting of the Glasgow corporation on Jan. 7th it was decided that a subcommittee should be appointed to consider the taking over by the corporation of the voluntary hospitals in Glasgow, and their administration as corporation institutions. The decision was approved by 50 votes to 39—2 members declining to vote. Speaking against the proposal, members of the Progressive party pointed out that the Government are at present considering the report prepared by the Committee on Scottish Health Services so that this local action is redundant and would be a sheer waste of time. It was also pointed out that the health committee has already in hand more work than at any time in the past twenty-five years. Others deprecated the burdening of the rates with expenses which at present were being met by voluntary subscriptions. Mr. A. Whyte (Independent Labour Party), who submitted the motion, said he hoped the subcommittee would decide that the corporation should control the hospital services in the city and that the Government should accept the financial responsibility. Criticising methods at present adopted to raise money for hospitals he asked, "Why should people have to beg for money to bring relief to those who suffer?" and described waiting-lists as a crime. Mr. T. A. O'Hara (Socialist), convener of the health committee, said they were agreed as to the valuable work done by the voluntary hospitals in the past, but he thought it desirable that a hospital system should be developed which would get rid of the long waiting-lists. Their inquiry would not prejudice any action which the Government might take, and they might be able to get information that would be of value to the Government.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capts. H. B. Parker, D.S.C., to *President*, for Medical Dept., Admiralty; K. H. Hole, O.B.E., and C. F. O. Sankey, O.B.E., to *President*, for course; G. R. McCowen, O.B.E., to *Drake*, for R.N.B.; J. C. Clouston to *Osprey*, for course; and C. L. Robertson to *President*, for staff course.

Surg. Lt.-Comdr. C. Keating to be Surg. Comdr.

Surg. Lt.-Comdr. T. W. Froggatt to *Pembroke*, for R.N.B.

Surg. Lts. D. D. Steele-Perkins, D. B. Jack, and G. H. C. R. Critien to *Queen Elizabeth*; C. J. P. Pearson to *Drake*, for R.N.B.; F. W. Baskerville and C. J. Robarts to *Pembroke*, for R.N.B.; I. C. Macdonald to *Drake*, for R.N.B.; N. M. McArthur to *Sandwich*; T. A. Turnbull to *Moth*; I. McN. A. Drysdale to *Folkestone*; J. L. S. Steele-Perkins to *Tamar*, addl.; and F. H. Lamb to *Tarantula*.

Mr. J. Adam of Kentish Town has been appointed Admiralty Surgeon and Agent for the London District No. 16.

ARMY MEDICAL SERVICES

The War Office announces that Prof. G. Hadfield, F.R.C.P., Department of Pathology, St. Bartholomew's Hospital, has been appointed Honorary Consultant in Pathology to the Queen Alexandra Military Hospital, Millbank, S.W. 1, in succession to the late Prof. E. H. Kettle.

Maj. G. T. Garraway, R.A.M.C., has been appointed Dep. Asst. Dir.-Gen., Army Med. Servs., War Office.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. A. H. T. Davis, having attained the age for retirement, is placed on ret. pay.

Maj. and Bt. Lt.-Col. D. C. Monro to be Lt.-Col.

ARMY DENTAL CORPS

Short Service Commissions: F. G. B. Waddell to be Lt. (on prob.).

TERRITORIAL ARMY

Lt.-Col. W. F. Mackenzie, T.D., resigns his commn. and retains his rank, with permission to wear the prescribed uniform.

Maj. A. MacG. Duff, M.C., R.A.M.C., T.A., to comd. the Med. Unit of the Edin. Univ. Contgt., Sen. Div., O.T.C.

Capt. W. R. Everatt from T.A. Res. of Off. (5th Bn. W. Yorks R.) to be Capt.

Lt. O. T. Wade to be Capt.

Lt. R. Ropner, late 5th Bn. Durham L.I., to be Lt.

J. C. Fletcher (late Offr. Cadet, Edin. Univ. Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Lt.

G. H. James (late Cadet, St. John's Sch. Contgt., Jun. Div., O.T.C.) to be Lt.

N. M. Stephen to be Lt.

Supernumerary for service with O.T.C.: A. W. D. Leishman (late Cadet Serjt., Westminster Sch. Contgt., Jun. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE

Squadron Leader P. H. Perkins to R.A.F. Station, Ismailia, Egypt.

Flight Lts. L. S. Everett to Headquarters, R.A.F., Middle East, Cairo, Egypt; and F. H. Peterson to No. 4 Flying Training School, Abu Sueir, Egypt.

The undermentioned Flight Lts. are granted permanent commissions in that rank: H. Bannerman and I. Mackay.

Flight Lt. H. S. Barber is transferred to the Reserve, Class D.

Flight Lt. M. T. O'Reilly resigns his permanent commission.

Flying Offr. R. M. Outfin to No. 1 Armament Training Camp, Catfoss.

INDIAN MEDICAL SERVICE

Capt. W. Scott to be Maj.

Lt.-Col. J. J. Harper-Nelson, C.I.E., O.B.E., M.C., retires.

Indian Medical Department.—Asst. Surg. (1st Cl.) G. H. Blaker to be Lt. (Sen. Asst. Surg.).

COLONIAL MEDICAL SERVICE

Dr. J. H. Bartlett has been appointed Medical Officer, Kenya; Dr. G. V. Harry, Dr. T. B. Sinclair, and Dr. I. S. Parboosinghe, Medical Officers, Jamaica; Dr. W. C. G. Murray, Medical Officer, St. Lucia; Mr. D. Maclachlan, Dental Officer, Malaya; Mr. W. H. R. Still, Dental Surgeon, Falkland Islands; Mr. P. H. Tatchell, Dental Surgeon, Tanganyika. Dr. J. C. R. Buchanan becomes Senior Medical Officer, Somaliland; Dr. V. E.

Critien and Dr. G. F. T. Saunders, Senior Medical Officers, Gold Coast; Dr. R. Nixon, Assistant Director of Medical Services, Tanganyika; Dr. W. A. Young, Senior Medical Officer, Tanganyika; and Dr. H. D. Tonking, Senior Pathologist, Mauritius.

DEATHS IN THE SERVICES

Lt.-Col. W. KEAYS, R.A.M.C. (retd.), who died on Jan. 14th at Keynsham, Somerset, qualified L.R.C.P.I. (1874), M.R.C.P.I. (1879) and F.R.C.S.I. (1886). He became an army surgeon in 1878, surgeon-major in 1890, and Lt.-Col. R.A.M.C. in 1898, retiring in June, 1904. He served with the military expeditions to Cyprus in 1878, and Egypt in 1882, for which he received a medal and bronze star; in 1885 he was with the Sudan expedition and was present at the battle of Suakin. Later he was responsible for the health and medical treatment of troops in several parts of India, and on his retirement he was placed in medical charge of the troops in the Weymouth Command (1909–12). During the European war he was re-employed at Bristol on recruiting and pensions boards. Two of his sons are serving as officers in the Army.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index.

FROM A PUBLIC HEALTH CLINICIAN

IV

AT the vast cosmopolitan caravanserai which sometimes receives me upon my visits to London I sit at the bachelor's table and that brings to my mind the wisdom of June. Not the glorious month of which poets write and, indeed, June is not her name. She is just the pleasant, brisk, bright little lady that brings my breakfast and I named her June because her predecessor was called May. Between courses and mouthfuls, and when the superintendent is not looking, we converse and, although her vocabulary is more limited than that of Dr. Johnson, her small head is stuffed as full of wisdom as her large heart is with kindness. She has her own views of the guests which have alarmingly little relation to their exalted or humble stations. Some of us are repulsive, others charming, but she classes us all as more or very much less degrees of "nice." Lowest grade of all come the "really not at all nice," next come the "not nice," and next the "not very nice." More favoured customers may be "nice," "very nice," or at the top of the tree, "really very nice indeed."

A well-to-do, retired, bachelor doctor regales us with stories of travels he has made or of travel feasts that he is preparing. June comments, "all very well for him to make us jealous about the good times he has had or means to have, *he's only got himself to think about.*" And on reflection this applies to a number of those who appear fortunate.

An economic crisis and a prosperous business man loses his brisk manner and becomes reserved. Dark rims line his eyes and he eats less breakfast. One day he discusses suicide, he sympathises with the victims, and says how near he has been himself to that catastrophe. It gives June food for thought, "Oh, these prosperous business men, no one hears anything about it when they are piling up money, but, when anything goes wrong, they talk of suicide." At this point she whisks away my porridge plate and disappears into the blue, soon to return with bacon and eggs and to continue, "but there, I suppose we are the lucky people, nowadays, we just draw our money at the end of the week, and no need to worry about anything."

A retired colonel from India tells us wonderful stories about Indian magicians. Says June, "I think he must believe all he's told," then later, "most people believe three-quarters of what they are told and not more than a quarter is really true." And the colonel thought we were impressed!

The Lindbergh baby was the topic one breakfast time and June remarked, as she brought the fish, "our police would have found him in a few days; these Americans have a lot to say, but they're better on paper than in reality." With the bacon and kidneys she continued, "number 252 said last week that America expects that every other nation will do its duty." As usual she became mollified as the meal was ending. "I wish someone would pay my fare to America, I expect they are just as nice as we are when you get to know them." Indeed, so do I hope someone will take June to America—not that we want to lose her. She will return wiser than ever.

It was election time and we were all wondering how to suppress a very opinionated and loquacious diner from the north. In an unguarded moment he asked June which way she voted. "I always vote labour," said she, and vanished. Our friend's jaw dropped and he became silent, to us refreshingly silent. When he had gone June was confidential. "Of course I never have voted labour," said she, "they don't know enough about affairs and such like, but I thought it might quiet him." And it did.

Wisdom from divines, from hard-headed business men and from Members of Parliament is expected, but not always forthcoming. Give me the wisdom of June.

* * *

The slump is passing and now let us hope the famine in Harley-street will also pass. The position is critical, there are more plates than ever in the select London spots, and yet a great deal of consulting work has passed to the provinces. The London consultant deserves sympathy, the small minority are very prosperous, some are the reverse, and the majority have a hard time with fabulous rents to pay; and constant teaching work with free consultations at hospital allows little time for earning. It is very unfair, but the effects of the famine are far reaching. The elaboration and prolongation of diagnosis and the complexities of treatment are not solely the result of scientific progress. Students are taught these methods and it is not always to the advantage of the community. Questioning an old friend who had achieved a considerable reputation in Harley-street as to his prosperity, he replied, "Oh, I am not yet wealthy, but thank goodness I can now afford to be honest." As far as the speaker was concerned the remark had no substratum of truth; let us hope it would not often be strictly accurate; the majority of doctors are ever ready to confess their faults and to join in any

merriment at their own expense, but the amusing cynicism may create an unfortunate impression when displayed among the laity.

* * *

We hear classical music from ancient and modern composers on the air and at the Queen's Hall, jazz rhythm at untold restaurants and dance saloons, as well as from the B.B.C. The merits of different music are difficult for my generation to assess. Souza's band appealed to me, and, when jazz first was played I liked the liveliness of the tunes, which reminded me of the national anthem of Zanzibar. Now for so many years we have heard so much jazz that it creates within me unpleasant emotions, whereas classical music arouses more pleasurable emotions, and seems to stimulate thought. At different ages the effect may vary, for young people assure me that the rhythm of jazz is delightful and suggests the pleasures of dancing; to me dancing is a minor erotic pastime, to be indulged in only as convention demands, and jazz, therefore, has no appeal. It certainly seems that a taste for what is called good music is more often acquired than inborn. Perhaps coming years will provide us with a new type of music, or new tunes, or in another 20 years my opinion about such topics will have changed. Any individual with a progressive mind may be expected to change his views at least every 10 years.

* * *

After discussing music it may be fitting to turn our minds to art. A vast subject indeed, and one which appeals to doctors; some of them are artists of merit, while many sketch in a dilettante way. At the Herkomer school in my student days I met many artists and found them original and cheery folk, sometimes moody, always intelligent, and with a fondness for the pleasures of life. One of them I chaperoned and assisted to secure suitable subjects at the London Hospital for a composite full-page drawing in an illustrated paper, which would indirectly assist our quinquennial appeal. In the same artist's studio were numerous pictures in colour or black and white, one of which represented an accident to boats during Cambridge May week. The artist told me he had been congratulated on the number of lifelike portraits of Cambridge celebrities, "and yet," he said, "they are all drawn from two models." He showed me the similarity of the faces, and with the clues thus provided I have noticed that the same method is generally used by artists, sometimes the model posing as a man, sometimes as a woman. No doubt this fact is already known to most readers but it was new to me.

Modern trends in art are, to the simple layman, bewildering. It was interesting to be taken round the Royal Academy by an artist and made to realise the value of broad and distant impressions in landscape painting and to be informed that the heavy, square, naked forms depicted in some studies showed strength rather than ugliness, which had been my unfettered opinion. In spite of all information I still regard those forms as ugly, though ready to believe that strength was what the artist intended to convey; therein lies the insuperable difficulty of most modern artistic trends including abstract art and surrealism. The writer of a letter, review, or journalistic paragraph may fail to convey his exact meaning to the reader although the whole English vocabulary is at his command; the painter of a picture is in a truly impossible position when seeking to convey ideas or conceptions through the vision of various forms or appearances painted on canvas. It seems certain to me that the majority of intelligent observers would form widely different conceptions of what is intended. Should we, therefore, taboo these modern strivings to represent on canvas thought or emotions, conscious or subconscious? Certainly not. This new art is an advance which may fail to-day and yet have a great future when the artists' powers of expression and the world's knowledge of psychology have both advanced.

CORRESPONDENCE

URETHRAL RUPTURE WITHOUT EXTRAVASATION

To the Editor of THE LANCET

SIR,—It is not perhaps generally recognised that intrapelvic laceration of the urethra may give rise to retention and not extravasation of urine. We have recently had experience of two cases in one of which there was retention without extravasation for as long as 29 hours after the urethral injury, while in the other retention was present for 12½ hours. It is important to recognise this protective power of the sphincter to hold up urine within the bladder and prevent its extravasation, because the surgeon who is unfamiliar with the fact may be tempted into a hurried operation on a badly shocked patient in the belief that he is thereby guarding his patient from imminent extravasation. The patient with this type of urethral rupture is typically a youth who has been run over and sustained a fracture of the pubic arch with complete laceration of the urethra and severance of the puboprostatic ligaments. At operation the bladder in both of our cases was the size of a coconut. It should be mentioned that the delay of nearly 30 hours was not deliberate on our part, for this period elapsed between the time of the accident and the boy's admission to hospital. We are impressed with this further example of a natural protective mechanism. Both cases have done well after operative treatment.

We are, Sir, yours faithfully,

LAMBERT ROGERS,
A. L. D'ABREU.

Surgical Unit, Royal Infirmary, Cardiff, Jan. 13th.

HOSPITAL AMALGAMATION IN LIVERPOOL

To the Editor of THE LANCET

SIR,—In reply to Mr. Bedwell's letter in your issue of Jan. 2nd (p. 51) the Liverpool United Hospital Bill was deposited at the Private Bill office on Nov. 27th, 1936, and Mr. Bedwell's quotations from the Bill are taken from the text as printed on that date. Subsequent to deposit, however, certain amendments in the text have been made by the promoters of the Bill, and I should be grateful if you would allow me to make certain corrections in those portions of the text which have been quoted. They are:

(*a*) "No rule regulation or recommendation of the medical board" now reads "No resolution of the medical board."

(*b*) "The medical board shall have the supervision of the medical and surgical work of the Hospital and all matters relating to the purchase of surgical instruments and apparatus shall be referred to the medical board but

that board shall not have power to purchase any instruments or apparatus without the previous sanction of the general committee" now reads "The medical board shall have the supervision of the medical and surgical work of the Hospital save that all matters relating to the purchase of surgical instruments and apparatus shall be dealt with by the general committee."

(c) The governing body of the Liverpool United Hospital according to the amended Bill will consist of fifty-three and not fifty-one members, the representation of the Merseyside Hospitals Council having been raised from two to four persons.

In addition, Mr. Bedwell draws attention to three specific problems. The first concerns a provision permitting the allocation of a percentage of the receipts from the Merseyside Hospitals Council to staff funds. The amendment suggested to meet this point authorises members of the honorary medical and surgical staffs of the hospital "to receive payments under any special arrangements" in respect of "services provided or rendered by the Hospital to patients students or probationers or to institutions local authorities or other bodies."

Secondly, Mr. Bedwell refers to the omission of a reference to the constitution of the Associated Voluntary Hospitals Board. This body, which represents the nine teaching hospitals in Liverpool, has been empowered by them to make recommendations concerning candidates for posts on the honorary staffs of all Liverpool teaching hospitals, and it is hoped that thereby the work of these hospitals may be coördinated to a degree impossible under the system whereby appointments in the past have been made by each individual hospital without relation to other hospitals associated with the same medical school. In the opinion of Parliamentary Counsel a close definition of the constitution of the Associated Voluntary Hospitals Board is unnecessary in the United Hospitals Bill.

Thirdly, Mr. Bedwell states that there is no provision for the representation on the medical board of specialists other than physicians and surgeons (together with dental surgeons, pathologists, and anæsthetists for whom specific provision is made). This is not the case. In the first instance the medical board of the United Hospital is to consist, by definition, of the holders of all posts set forth in Part I of the annexe to the Bill, and the posts there set forth include the obstetricians, gynæcologists, radiologists, and other specialists to whom Mr. Bedwell refers. All persons subsequently appointed to fill vacancies which occur in the list of posts set forth in Part I of the annexe, and all persons appointed to fill "all additional offices of a character similar to those held by the persons whose names are set out in Part One of the Annexe" will become members of the medical board.

I am, Sir, yours faithfully,

A. V. J. HINDS,
Secretary, Associated Voluntary Hospitals Board.

Water-street, Liverpool, Jan. 13th.

RADIOGRAM AND RADIOGRAPH

To the Editor of THE LANCET

SIR,—In reading through the supplement to your issue of Jan. 2nd I note that you state your preference for the word *radiogram*. Personally I have always used during the past 20 years the term *radiograph* in all my writings—a procedure which is in accord with the Shorter Oxford English Dictionary (p. 1649). I agree with your call for uniformity and I am willing to comply; but I should be glad to know why you use the term radiogram which is commonly used for wireless messages and for radiogramophones. Surely a photograph, and the process used in obtaining such, is so similar that it would seem more reasonable to associate the accepted terms photograph, to photograph, photographic, and photographer, with radiograph, to radiograph, radiographic, and radiographer.—I am, Sir, yours faithfully,

JAMES F. BRAILSFORD.

Edgbaston, Birmingham, Jan. 5th.

To the Editor of THE LANCET

SIR,—In your supplement "On Writing for THE LANCET" there is one thing and one thing only with which I disagree, and that is the use of the words "radiogram" and "radiograph." Whether we like it or not these terms are now wedded for ever to apparatus for the combined reception of broadcasting and the production of gramophone records, as well as being also used for telegrams transmitted by wireless. I think an effort should be made in medical journals to popularise the use of a "skiagram"; and if you do not like the verb "to X ray," why should we not say that the patient was examined by X rays?—I am, Sir, yours faithfully,

London, W., Jan. 8th. A MEDICAL JOURNALIST.

*** Our preference for *radiogram* is based on the analogy of *telegraph* and *telegram*. *Telegraph* dates from the eighteenth century, but it was not until the 1850's that the need was felt for something simpler than *telegraphic message*, and *telegram* was devised to signify what was written by the telegraph. The "Oxford Dictionary" points out that the great bulk of the words ending in *-graph* is composed of technical terms of very recent invention, mostly expressing the general sense of "that which writes, portrays or records." In medicine, as elsewhere, there are various examples of *-graph* in the agent sense which have been complemented by *-gram* in the passive or resultant sense (e.g., *electrocardiograph*, *electrocardiogram*). *Photograph*, which Dr. Brailsford quotes as precedent, is really an unlucky exception to a convenient rule: the public for some reason never took to *photogram*—perhaps because there was no chance of confusing *photograph* with *camera*. The earliest reference we can find to *radiogram* is in April, 1896, and not long afterwards, alas, we were queering our own pitch by using *radiograph* for the picture rather than the machine that makes it. *Radiogram*, as meaning a wireless telegram, was current in 1905; and at that time the wireless experts also claimed *radiography* as their own. The medical profession seems to have regained *radiography* and it might still regain *radiogram*. As "A Medical Journalist" says, there is nothing much against *skiagram*; except that *skiascopy* (which would be the equivalent of *radioscopy*) already means the determination of the refracting action of the eye. We mentioned "the skiagram of a sireniform monster" in April, 1896, and are prepared, if need be, to do so again. But if the medical profession in this country is really to retire in disorder before the advancing host of gramophone-cum-radio manufacturers, would it not be best to join forces with our American colleagues and take our stand on *roentgenograph* and *roentgenogram*—words whose possession no one is likely to dispute?—ED. L.

NASAL SINUSITIS IN CHILDHOOD

To the Editor of THE LANCET

SIR,—I have read with interest Mr. Asherson's letter in your last issue. He says that "a difficult problem arises in considering the treatment of the chronic cases—and many become so in spite of all

merriment at their own expense, but the amusing cynicism may create an unfortunate impression when displayed among the laity.

* * *

We hear classical music from ancient and modern composers on the air and at the Queen's Hall, jazz rhythm at untold restaurants and dance saloons, as well as from the B.B.C. The merits of different music are difficult for my generation to assess. Souza's band appealed to me, and, when jazz first was played I liked the liveliness of the tunes, which reminded me of the national anthem of Zanzibar. Now for so many years we have heard so much jazz that it creates within me unpleasant emotions, whereas classical music arouses more pleasurable emotions, and seems to stimulate thought. At different ages the effect may vary, for young people assure me that the rhythm of jazz is delightful and suggests the pleasures of dancing; to me dancing is a minor erotic pastime, to be indulged in only as convention demands, and jazz, therefore, has no appeal. It certainly seems that a taste for what is called good music is more often acquired than inborn. Perhaps coming years will provide us with a new type of music, or new tunes, or in another 20 years my opinion about such topics will have changed. Any individual with a progressive mind may be expected to change his views at least every 10 years.

* * *

After discussing music it may be fitting to turn our minds to art. A vast subject indeed, and one which appeals to doctors; some of them are artists of merit, while many sketch in a dilettante way. At the Herkomer school in my student days I met many artists and found them original and cheery folk, sometimes moody, always intelligent, and with a fondness for the pleasures of life. One of them I chaperoned and assisted to secure suitable subjects at the London Hospital for a composite full-page drawing in an illustrated paper, which would indirectly assist our quinquennial appeal. In the same artist's studio were numerous pictures in colour or black and white, one of which represented an accident to boats during Cambridge May week. The artist told me he had been congratulated on the number of lifelike portraits of Cambridge celebrities, "and yet," he said, "they are all drawn from two models." He showed me the similarity of the faces, and with the clues thus provided I have noticed that the same method is generally used by artists, sometimes the model posing as a man, sometimes as a woman. No doubt this fact is already known to most readers but it was new to me.

Modern trends in art are, to the simple layman, bewildering. It was interesting to be taken round the Royal Academy by an artist and made to realise the value of broad and distant impressions in landscape painting and to be informed that the heavy, square, naked forms depicted in some studies showed strength rather than ugliness, which had been my unfettered opinion. In spite of all information I still regard those forms as ugly, though ready to believe that strength was what the artist intended to convey; therein lies the insuperable difficulty of most modern artistic trends including abstract art and surrealism. The writer of a letter, review, or journalistic paragraph may fail to convey his exact meaning to the reader although the whole English vocabulary is at his command; the painter of a picture is in a truly impossible position when seeking to convey ideas or conceptions through the vision of various forms or appearances painted on canvas. It seems certain to me that the majority of intelligent observers would form widely different conceptions of what is intended. Should we, therefore, taboo these modern strivings to represent on canvas thought or emotions, conscious or subconscious? Certainly not. This new art is an advance which may fail to-day and yet have a great future when the artists' powers of expression and the world's knowledge of psychology have both advanced.

CORRESPONDENCE

URETHRAL RUPTURE WITHOUT EXTRAVASATION

To the Editor of THE LANCET

SIR,—It is not perhaps generally recognised that intrapelvic laceration of the urethra may give rise to retention and not extravasation of urine. We have recently had experience of two cases in one of which there was retention without extravasation for as long as 29 hours after the urethral injury, while in the other retention was present for 12½ hours. It is important to recognise this protective power of the sphincter to hold up urine within the bladder and prevent its extravasation, because the surgeon who is unfamiliar with the fact may be tempted into a hurried operation on a badly shocked patient in the belief that he is thereby guarding his patient from imminent extravasation. The patient with this type of urethral rupture is typically a youth who has been run over and sustained a fracture of the pubic arch with complete laceration of the urethra and severance of the puboprostatic ligaments. At operation the bladder in both of our cases was the size of a coconut. It should be mentioned that the delay of nearly 30 hours was not deliberate on our part, for this period elapsed between the time of the accident and the boy's admission to hospital. We are impressed with this further example of a natural protective mechanism. Both cases have done well after operative treatment.

We are, Sir, yours faithfully,

LAMBERT ROGERS,
A. L. D'ABREU.

Surgical Unit, Royal Infirmary, Cardiff, Jan. 13th.

HOSPITAL AMALGAMATION IN LIVERPOOL

To the Editor of THE LANCET

SIR,—In reply to Mr. Bedwell's letter in your issue of Jan. 2nd (p. 51) the Liverpool United Hospital Bill was deposited at the Private Bill office on Nov. 27th, 1936, and Mr. Bedwell's quotations from the Bill are taken from the text as printed on that date. Subsequent to deposit, however, certain amendments in the text have been made by the promoters of the Bill, and I should be grateful if you would allow me to make certain corrections in those portions of the text which have been quoted. They are:

(*a*) "No rule regulation or recommendation of the medical board" now reads "No resolution of the medical board."

(*b*) "The medical board shall have the supervision of the medical and surgical work of the Hospital and all matters relating to the purchase of surgical instruments and apparatus shall be referred to the medical board but

that board shall not have power to purchase any instruments or apparatus without the previous sanction of the general committee" now reads "The medical board shall have the supervision of the medical and surgical work of the Hospital save that all matters relating to the purchase of surgical instruments and apparatus shall be dealt with by the general committee."

(c) The governing body of the Liverpool United Hospital according to the amended Bill will consist of fifty-three and not fifty-one members, the representation of the Merseyside Hospitals Council having been raised from two to four persons.

In addition, Mr. Bedwell draws attention to three specific problems. The first concerns a provision permitting the allocation of a percentage of the receipts from the Merseyside Hospitals Council to staff funds. The amendment suggested to meet this point authorises members of the honorary medical and surgical staffs of the hospital "to receive payments under any special arrangements" in respect of "services provided or rendered by the Hospital to patients students or probationers or to institutions local authorities or other bodies."

Secondly, Mr. Bedwell refers to the omission of a reference to the constitution of the Associated Voluntary Hospitals Board. This body, which represents the nine teaching hospitals in Liverpool, has been empowered by them to make recommendations concerning candidates for posts on the honorary staffs of all Liverpool teaching hospitals, and it is hoped that thereby the work of these hospitals may be coördinated to a degree impossible under the system whereby appointments in the past have been made by each individual hospital without relation to other hospitals associated with the same medical school. In the opinion of Parliamentary Counsel a close definition of the constitution of the Associated Voluntary Hospitals Board is unnecessary in the United Hospitals Bill.

Thirdly, Mr. Bedwell states that there is no provision for the representation on the medical board of specialists other than physicians and surgeons (together with dental surgeons, pathologists, and anæsthetists for whom specific provision is made). This is not the case. In the first instance the medical board of the United Hospital is to consist, by definition, of the holders of all posts set forth in Part I of the annexe to the Bill, and the posts there set forth include the obstetricians, gynæcologists, radiologists, and other specialists to whom Mr. Bedwell refers. All persons subsequently appointed to fill vacancies which occur in the list of posts set forth in Part I of the annexe, and all persons appointed to fill "all additional offices of a character similar to those held by the persons whose names are set out in Part One of the Annexe" will become members of the medical board.

I am, Sir, yours faithfully,

A. V. J. HINDS,
Secretary, Associated Voluntary Hospitals Board.
Water-street, Liverpool, Jan. 13th.

RADIOGRAM AND RADIOGRAPH

To the Editor of THE LANCET

SIR,—In reading through the supplement to your issue of Jan. 2nd I note that you state your preference for the word *radiogram*. Personally I have always used during the past 20 years the term *radiograph* in all my writings—a procedure which is in accord with the Shorter Oxford English Dictionary (p. 1649). I agree with your call for uniformity and I am willing to comply; but I should be glad to know why you use the term radiogram which is commonly used for wireless messages and for radiogramophones. Surely a photograph, and the process used in obtaining such, is so similar that it would seem more reasonable to associate the accepted terms photograph, to photograph, photographic, and photographer, with radiograph, to radiograph, radiographic, and radiographer.—I am, Sir, yours faithfully,

JAMES F. BRAILSFORD.
Edgbaston, Birmingham, Jan. 5th.

To the Editor of THE LANCET

SIR,—In your supplement "On Writing for THE LANCET" there is one thing and one thing only with which I disagree, and that is the use of the words "radiogram" and "radiograph." Whether we like it or not these terms are now wedded for ever to apparatus for the combined reception of broadcasting and the production of gramophone records, as well as being also used for telegrams transmitted by wireless. I think an effort should be made in medical journals to popularise the use of a "skiagram"; and if you do not like the verb "to X ray," why should we not say that the patient was examined by X rays?—I am, Sir, yours faithfully,

London, W., Jan. 8th. A MEDICAL JOURNALIST.

*** Our preference for *radiogram* is based on the analogy of *telegraph* and *telegram*. *Telegraph* dates from the eighteenth century, but it was not until the 1850's that the need was felt for something simpler than *telegraphic message*, and *telegram* was devised to signify what was written by the telegraph. The "Oxford Dictionary" points out that the great bulk of the words ending in *-graph* is composed of technical terms of very recent invention, mostly expressing the general sense of "that which writes, portrays or records." In medicine, as elsewhere, there are various examples of *-graph* in the agent sense which have been complemented by *-gram* in the passive or resultant sense (e.g., *electrocardiograph*, *electrocardiogram*). *Photograph*, which Dr. Brailsford quotes as precedent, is really an unlucky exception to a convenient rule: the public for some reason never took to *photogram*—perhaps because there was no chance of confusing *photograph* with *camera*. The earliest reference we can find to *radiogram* is in April, 1896, and not long afterwards, alas, we were queering our own pitch by using *radiograph* for the picture rather than the machine that makes it. *Radiogram*, as meaning a wireless telegram, was current in 1905; and at that time the wireless experts also claimed *radiography* as their own. The medical profession seems to have regained *radiography* and it might still regain *radiogram*. As "A Medical Journalist" says, there is nothing much against *skiagram*; except that *skiascopy* (which would be the equivalent of *radioscopy*) already means the determination of the refracting action of the eye. We mentioned "the skiagram of a sireniform monster" in April, 1896, and are prepared, if need be, to do so again. But if the medical profession in this country is really to retire in disorder before the advancing host of gramophone-cum-radio manufacturers, would it not be best to join forces with our American colleagues and take our stand on *roentgenograph* and *roentgenogram*—words whose possession no one is likely to dispute?—ED. L.

NASAL SINUSITIS IN CHILDHOOD

To the Editor of THE LANCET

SIR,—I have read with interest Mr. Asherson's letter in your last issue. He says that "a difficult problem arises in considering the treatment of the chronic cases—and many become so in spite of all

types of treatment." It is to be regretted that no mention is made of one of the most useful forms of treatment in such cases—i.e., radiotherapy. By this I mean treatment with short (wireless) waves and infra-red rays, the application of ultra-violet rays by means of quartz applicators attached to the Kromayer mercury-vapour lamp to the nostrils and the postnasal space, and general ultra-violet irradiation to increase the patient's general resisting powers. I have described elsewhere (Therapeutic Uses of Infra-red Rays, 3rd ed.) the technique and rationale of this treatment.

The majority of such children suffer from hypovitaminosis; therefore general ultra-violet irradiation of itself must be particularly beneficial to them. Suffice it to say that many of us have treated a great number of such cases, and the results are rarely disappointing. Almost all the patients are relieved if not cured. The fact that this form of treatment causes no pain or discomfort from its inception must make it a pleasing alternative to the methods suggested by Mr. Asherson.—I am, Sir, yours faithfully,

W. ANNANDALE TROUP.

Wimpole-street, W., Jan. 18th.

INFORMATION SERVICE FOR RESEARCH WORKERS IN HUMAN GENETICS

To the Editor of THE LANCET

SIR,—My executive committee invites your coöperation in making known the service here announced. One activity contemplated in setting up the Clearing-House for Human Heredity is the organisation of information service for research workers in the subject. The value of such a plan has been demonstrated in the information service already established for workers on drosophila, &c. It should be noted that apart from convenience of ascertaining easily centres at which comparable work is going on, the circulation of notice of their work by those engaged in a particular inquiry is a safeguard in dating priority—a point to which it is natural to attach some importance.

Workers are requested to address to the Bureau a short paragraph describing the work on which they are engaged. These notices will be multiplied and circulated to all those coöperating. In the first instance this bulletin will be issued every twelve months. Later supplementary bulletins will be issued more frequently. Those using this service are asked to subscribe 5*s*., a sum equalling approximately one-quarter of a pound sterling equivalent in the currency of their country. The accepted languages are French, German, English.—I am, Sir, yours faithfully,

R. RUGGLES GATES,
Chairman, Bureau of Human Heredity.

115, Gower-street, London, W.C.1, Jan. 14th.

TUBERCULOUS DISEASE OF THE ABDOMINAL LYMPHATIC GLANDS

To the Editor of THE LANCET

SIR,—May I state my views on this subject from the point of view of a medical superintendent of an institution for non-pulmonary tuberculosis? Almost all the cases that are admitted do extremely well on the usual form of treatment for all kinds of tuberculosis—viz., fresh air, nourishing food, and rest. In addition they receive artificial light (carbon arc), the old-fashioned ung. hydrarg. rubbed into the abdomen, fresh tomato juice (one ounce three times a day), and careful regulation of the bowels with liquid paraffin when necessary. I am convinced, however, that the fresh air, good food, and rest are the main essentials of the treatment. The response to treatment is much more rapid than in other forms of non-pulmonary tuberculosis. Among the minority which do badly are those which have had surgical intervention before admission. They often have an indolent operation wound discharging pus which is very resistant to treatment, while others have that distressing condition—fæcal fistula. We do not see the type of case that is admitted to a general hospital with acute symptoms simulating other abdominal conditions, and in which the diagnosis is in doubt until the operation is performed. With the exception of this type of case I am of the opinion that the place for patients suffering from tuberculous abdominal lymphatic glands is an open-air hospital, and that the treatment should be on conservative lines.

I most heartily agree with Mr. Colt and Mr. Clark (THE LANCET, Jan. 16th, p. 125) in their final conclusion that "Tuberculosis of the mesenteric glands tends in the main to natural cure," but not with their statement earlier in the paper that "it seems also that when a pre-operative diagnosis of caseous glands has been made the safest treatment is removal." My view is that when a pre-operative diagnosis of tuberculous mesenteric glands has been made the safest treatment is non-surgical in the vast majority of cases.—I am, Sir, yours faithfully,

E. H. ALLON PASK,
Medical Superintendent.

Wrightington Hospital, Appley Bridge, near Wigan, Jan. 19th.

DR. RENALD FERNALD

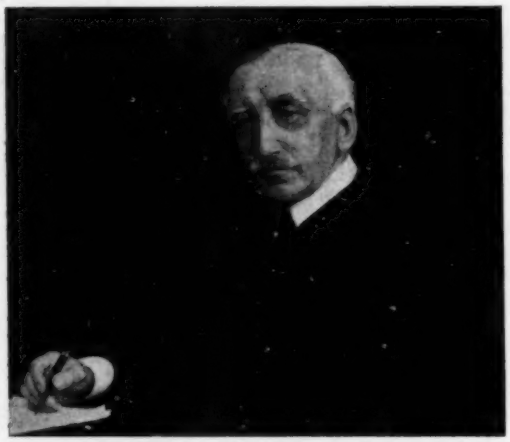
We have received the following questions from a lady named Fernald who is seeking information concerning an ancestor:

"I am trying to locate my ancestor Dr. Renald Fernald (Fernall, Fernell, Furnell, Farnell; or possibly, Fernefold or Fernewold), who went to America about 1630 or 31 as 'chirurgeon' of the Piscatagua Colony (Mason's Plantation), now Portsmouth, New Hampshire, but for a while part of Maine. He was a leader in town affairs, being one of the first to sign a grant of Glebe for church land in 1640, and a petition to Boston General Court in 1653 to change the name of the town, then Strawberry Bank, to Portsmouth. He was first town clerk and recorder, commissioner, surveyor, as well as 'chirurgeon.' He thus was apparently a well-educated man, but we do not know anything of the English home of the family. I have hoped to locate him through his profession, but so far without success. There is a tradition that he came from Chester or from near Chester and that he resigned from the English Navy to go to America. I have been through a number of the Harleian MSS. (unpublished ones) in the British Museum relating to officers in the Navy at that time but no names are given. A coat of arms of the Fernefold family of Sussex was accepted by some members of our family four or five generations ago as being that of Dr. Renald's family, but I do not believe it has anything to do with us. Dr. Renald's will, referred to by several of his children, has never been found, but his wife's is preserved at Concord, New Hampshire, and is signed 'Johanna Fernall.' Dr. Renald probably used a final 'd' because it went well with his first name. I have been told that there are records (of the late fifteenth and/or first half of the sixteenth century) showing that each 'doctor' or 'chirurgeon' who was qualified had a certificate showing that he possessed a set of chirurgeon's instruments and that he was qualified to enter the profession. How true is this and to what extent was it enforced, if true? Does anyone know? And were there lists kept of those to whom certificates were issued? As far as Dr. Renald Fernald was concerned we only know that his wife Johanna willed to her son John 'all the surgery books and instruments that were his father's with his chest.'"

OBITUARY

WILLIAM HUNTER, C.B., M.D. Edin., F.R.C.P. Lond., F.R.S.E.

Dr. William Hunter, who died of cerebral thrombosis in a London nursing-home on Jan. 13th, was born at Ballantrae on the Ayrshire coast in 1861, the son of the late Robert Hunter. He received his medical education at Edinburgh University where he was a brilliant student and was awarded the Ettles scholarship and later the first Lucas Walker research studentship at Cambridge. Abroad he studied for a time in Leipzig, Vienna, and Strasbourg. His academic honours included an M.D. (gold medal) and as recently as 1927 the Hon. LL.D. Edin. He came to London in the early 'nineties and was at first attached to the West London and the London Fever Hospitals. In 1895 he joined the Charing



DR. HUNTER

[Photograph by Vandyk

Cross Hospital medical school and in 1903 became assistant physician to the hospital. In 1896 he was elected F.R.C.P. Lond., and afterwards was an examiner for the diploma of the college, and for the final medical subjects at Cambridge and Glasgow universities.

During his long life in London Hunter's medical interests were centred in Charing Cross and the London Fever hospitals, of which he eventually became senior physician, and he was elected a vice-president of Charing Cross. He was dean of the medical school from 1911 to 1915 and built up the department of pathology and bacteriology which became the present "Institute of Pathology." It was in these laboratories that he pursued his researches, begun at Cambridge, on focal sepsis and its relation to the severe anæmias. His interest in the hospital and school was deep and continuous. He was a regular attendant at council and committee meetings, played a prominent part in stabilising the financial position of both hospital and school at a critical period, and was largely instrumental in reconditioning and enlarging the school, part of the cost of which he himself defrayed. His interests were not confined, however, to the laboratory and wards, as he had historical and antiquarian leanings which culminated in his writing an appreciative and intriguing book entitled an "Historical Account of Charing Cross Hospital and Medical School."

In 1915 during the Great War Hunter went to Serbia with the rank of colonel in charge of the British Sanitary Mission to assist the Serbian authorities in controlling a serious epidemic of typhus, an onerous task which he carried out with all his energy and resourcefulness, in the face of extreme difficulties. The main problem at issue was the eradication of lice, which were carriers of the fever, and he was responsible for the idea of the destruction of these and other vermin by what became known as the "Serbian barrel" and the "delousing train." For his services in Serbia he was awarded the decoration of grand officer of the Order of St. Sava. After Serbia, from 1915 to 1917, he acted as president of the committee for the control of infectious diseases in the Eastern theatres of the war, and in this he was associated among others with his old friend the late Sir Andrew Balfour. By his personal charm and tact as chairman of that committee he created an atmosphere of harmony which was felt by those who came in contact with this "peripatetic group of distinguished scientists." But his strenuous labours in the East undermined his health, and after the war he seemed to have lost some of that intense enthusiasm which characterised his early days. For his war services he was awarded the C.B.

Hunter's principal contribution to medicine was his work on the severe anæmias and "oral sepsis," a comprehensive term which he introduced into the literature. He separated pernicious anæmia as an entity from the secondary anæmias and insisted on the importance of oral sepsis in its ætiology, and although recent advances in hæmatology have modified this view, by his pioneer researches he threw much light on the clinical and gross pathological aspects of that disease.

As a teacher he was in no way stereotyped but was an inspiration to his students to think and observe for themselves and succeeded in infecting them with his own enthusiasm. As a man Hunter was a lovable character, beloved alike by his colleagues and students. Many a time in committee his flair for saying the kind thing bridged over difficulties and frictions where reasoned argument had failed. Those who had the privilege of his friendship will always treasure the memory of a "very perfit gentil knight." The deepest sympathy of all who knew him will go out to his widow.

The funeral service took place at St. Columbus Church of Scotland and he was buried in the cemetery at East Sheen.

J. M. H. M.

Prof. Ledingham writes: "As one who recalls with pleasure an intimate companionship with the late Dr. William Hunter during a period in his career when his varied talents were placed at the country's service, may I be allowed a brief note of appreciation? It has been said that the war turned William Hunter, the consulting physician, into an administrator and expert in practical hygiene, and I can readily believe the truth of this. In pre-war days I knew him as an authority on pernicious anæmia on the symptomatology and natural history of which he had written widely, and as an unwearied protagonist of the view that some specific toxin derived in all probability from the product of oral or intestinal sepsis was

responsible for the hæmolytic phenomena to which he attached a primary and cardinal importance. Hunter was well qualified to propound these views, as during his pathological career he had made an important experimental contribution to our knowledge of blood destruction and its relationship to jaundice by his work on toluylenediamin. Even now, though we have learnt to cure or rather to keep in abeyance the condition that Hunter made his life-study, its precise pathogenesis still eludes us.

"When I joined Hunter and his little band of sanitary advisors in Cairo at the close of 1915, Hunter was already a seasoned traveller in war zones. In February, 1915 he had led the British sanitary mission to Serbia, and there he had been busily engaged in the control of typhus till June of that year when he became chairman of the medical advisory committee dispatched by the War Office to the Eastern Mediterranean. This was a new Hunter I found who carried his 55 years easily. Travel and new interests had served but to accentuate his sprightly and debonair figure. Pernicious anæmia was by no means forgotten, but now the Serbian barrel and the travelling railway van disinfector held the field. The former, a device of Lt.-Col. Stammers had served well in Serbia, and now when Egypt was rapidly filling up with imperial troops in the early months of 1916, the provision of similar measures became an urgent necessity. Hunter with his Serbian experience behind him was in his element. Well do I remember, at a wayside station in the desert, the first try-out of a railway-van steam disinfector, packed with tightly rolled kits, and an assortment of bacterial cultures and other test objects embedded in the mass. It was clear to most of the audience when the contents of the van were turned out that the pressure steam had done its work well, and at the finish as Hunter stood proud and happy adjusting a Laurens cigarette to his holder, a zealous but rather incredulous medical officer went up to him and in all seriousness asked: 'Will it kill a weevil, Sir?' 'A weevil?' said Hunter completely nonplussed but ready to bluff it out, 'A weevil? Has anybody got a weevil?' No one obliged, the crisis passed, and Hunter turned to me and whispered 'Most amazing! What is a weevil anyway?'

"Hunter's genial and kindly address did much to make things easier for the slacker faced with the omniscient Andrew Balfour full of the latest sanitary wrinkles and eager to impart them, and with the precise and inquiring George Buchanan rapidly filling his notebook with incriminating data shortly to be turned into formal reports for the information of the Higher Command. Unfortunately Hunter was unable to accompany the rest of us (Balfour, Buchanan, Wenyon, and myself) to Mesopotamia, but on our return to Egypt in 1917 we found him at his post and had the benefit of his counsel in the concluding stages of the committee's work. To me Hunter was the physician who had just missed developing into the experimental pathologist. His early inclinations, fostered as they were by the scholarships he held and the post-graduate studies he had made in Germany and elsewhere, were, he often told me, towards the laboratory life. Taken on the occasion of the International Congress of Hygiene held in London in 1891, he appears in a treasured photograph of the officers of the Bacteriological Section over which Sir Joseph Lister presided; this includes its three honorary secretaries, Ruffer, Hunter, and Sherrington, who also later left the bacteriological fold. The great war recalled to Hunter these primal urges, and he rose manfully to the occasion. In post-war days our active paths have crossed but once in connexion with the work of the People's League of Health in whose inquiries and report (1932) on bovine tuberculosis and the milk question he took an active part. Ave et vale."

JOHN ALEXANDER MacWILLIAM, M.D., LL.D. Aberd., F.R.S.

THE news of the death on Jan. 13th of Prof. J. A. MacWilliam, for 41 years occupant of the chair of physiology in Aberdeen University, has been received with deep regret. He died in an Edinburgh nursing-home in his 80th year, having retired from his professorial appointment in 1927. He was a distinguished student of Aberdeen University, where he graduated M.B., C.M. in 1880, and M.D. with highest honours in 1882. From 1882 to 1886 he was demonstrator of physiology at University College, London. In 1886 he was appointed professor of physiology in Aberdeen University in succession to Prof. Stirling, and during the long period while he filled this chair the physiology department in the University was reorganised and considerably extended. Prof. MacWilliam will be remembered, not only for his lucid teaching and important research work, but also for his personal qualities. His powers as a teacher and his example and influence as a man were much appreciated by his students and by the University for which he worked. He received the honorary degree of LL.D. Aberd. in 1928 and was elected F.R.S. in 1916. His investigations on the physiology of the heart and circulation are well known and were so advanced that it was not until many years after their publication that their full significance was adequately realised. As far back as 1887 he maintained that sudden death during the administration of chloroform is due to ventricular fibrillation.

PROF. MACWILLIAM

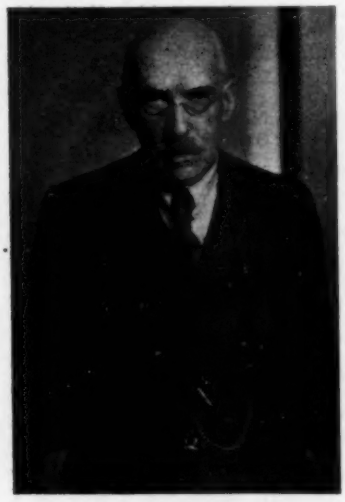
[Photograph by MacMahon

We owe to Prof. E. W. H. Cruickshank the following tribute: "By the death of Prof. J. A. MacWilliam, the University of Aberdeen and the medical sciences have lost a man who by devoted service to his Alma Mater and untiring zeal in scientific investigation had become known to many at home and abroad. As a teacher Prof. MacWilliam was noted for the clear and lucid manner in which he could present, with but the slightest reference to notes, the most difficult aspects of his subject. As a lecturer he had few equals; every lecture was a finished product, excellently arranged, clearly delivered, full of interest and incident. Few there were who attended his course in systematic physiology who did not realise that a memorising of facts was of little importance and that clear reasoning on

physiological problems must play a great part in the training of the mind for the practice of medicine. To know him as professor was to admire, but to know him as friend was to discover new and richer depths of character. In the quiet of the study one was introduced to a great personality. The experience of the years, and they were not without their share of sorrow and suffering, had produced a wonderful combination of philosophic insight and critical scientific judgment. By his personal qualities, always gracious, never unkindly critical, ever sympathetic, Prof. MacWilliam endeared himself to many generations of Aberdeen students. His charm of manner, his constant kindness and courtesy, won for him the affectionate regard of all who knew him intimately. In the world of science his name has an enduring place, in many and diverse circles his memory will long be cherished."

ARTHUR HUGH THOMPSON, M.D. Camb.

Dr. Hugh Thompson, whose death at his home in Hampstead was announced last week, was the youngest of eight children of Charles Thompson of Preswylfa, Cardiff, where he was born in 1859. He was sent to Quaker schools at Weston-super-Mare and Grove House, Tottenham, and then as Whewell scholar entered Trinity College, Cambridge, where he took the historical tripos in 1883. He remained for a time in Cambridge as a coach, giving extension lectures on history in the northern counties, and then went to Toynbee Hall as one of the earliest residents under Canon Barnett. The discovery of his interest in medicine led him back to Cambridge and then to the London Hospital, from which he qualified in 1891 at the age of 32 years. He was receiving-room officer and clinical assistant at the hospital, and after a short period of general practice decided to specialise in ophthalmic surgery.



DR. HUGH THOMPSON

[Photograph by Whitlock

Starting at Moorfields as clinical assistant, in 1898 he was appointed assistant surgeon to the Western Ophthalmic Hospital, becoming surgeon in 1901, and a member of the board of management in 1903; he remained associated with this hospital through the lean years and was largely instrumental in its resuscitation on modern lines. His training and equipment fitted him for critical observation rather than surgical technique; he was an excellent ophthalmoscopic observer, and more an ophthalmic physician than surgeon. In the care of out-patients he spared no time or trouble and he was assiduous in following them up, his major literary output being reports of clinical work of this nature. He also held appointments at the Blind School, Swiss Cottage, and the Royal Sailors' Orphan Girls' School, Fitzjohn's-avenue. During the war he was oculist to the Brook War Hospital. Early in his career he became joint editor of the *Ophthalmic Review*, and for ten years he contributed reviews of ophthalmological literature to the "Medical Annual." Of this part of his work it is possible to speak with some knowledge and assurance, for he was a contributor to these columns over a period of twenty years, and was in fact engaged on a review for THE LANCET on the morning of his death. His knowledge of languages, his broad outlook on men and manners, his keen interest in every detail of normal or pathological anatomy, and his command of simple natural expression made him an ideal contributor. About three years ago he had a cerebral hæmorrhage—fortunately on the right side, for he did not lose his power of speech and remained mentally alert through several relapses.

Dr. Thompson married in 1891 Ann Josephine, eldest daughter of Columbus Clothier of Street, Somerset. They had no children of their own. He travelled a good deal abroad and was one of the most pleasant holiday companions. He was a keen Liberal and supporter of the League of Nations.

WILLIAM JENKINS OLIVER, B.M. Oxon., M.R.C.P. Lond.

WE regret to announce the death on Jan. 11th in a Newcastle nursing-home of Dr. William Jenkins Oliver, the elder son of Sir Thomas Oliver, the well-known Newcastle physician. The death occurred suddenly from cardiac thrombosis as a sequel to a serious operation from which the patient appeared to be making a good recovery.

William Oliver was born in 1886, and was educated at Winchester and Oriel College, Oxford. He proceeded for his medical studies to the London Hospital, and graduated in 1911 as B.M. Oxon., later taking the diploma of M.R.C.P. Lond. He early decided to specialise in dermatology, and was for a time chief assistant in the skin department of the London Hospital under Dr. J. H. Sequeira. On the outbreak of war, with a commission as captain, R.A.M.C., he served as skin specialist at the base hospital at Rouen, and he remained for a period at Cologne with the Army of Occupation, acting as a skin specialist. He was popular with both officers and men in the Army, for he knew his work thoroughly well and was always sympathetic with his patients, and especially with the children. On his return to England he held the post of dermatologist at the Victoria Park and the Evelina hospitals for children, and acted in a similar capacity at the Prince of Wales General Hospital, Tottenham. He was never a very strong man—during the war he had undergone an operation for appendicitis at Rouen—and eventually he gave up a good deal of the dermatological practice which he had acquired in London, and decided to spend a considerable amount of time on a farm in Norway and Denmark, being an accomplished Scandinavian scholar, and also a great fisherman. He also studied in Oslo and in the Finsen Hospital at Copenhagen. In research work there he made many friends, chief among which was the veteran dermatologist, Prof. C. Rasch. He used his knowledge of Norwegian and Danish to translate several Scandinavian books into English, which met with a favourable reception in many journals and in these columns. Further, during his residence at Flekke, on the Sunnfjord, he every year acted as

locum tenens to the local doctor, enabling that practitioner to have a holiday. In that pleasant region distances are great and means of communication scanty, and Dr. Oliver came to know the conditions of life on the fjords as well as if he had been a farmer or a fisherman himself. Many of his patients there will feel the loss of a friend.

MARGARET THACKRAH, M.D., M.R.C.P. Lond.

Margaret Grace Thackrah, who died in London on Jan. 10th at the age of 56, was educated at the North London Collegiate School and University College, London, where she took her B.A. degree. In 1903 she entered the London School of Medicine for Women, qualifying M.B., B.S. Lond. in 1909. After holding appointments of house surgeon to the Royal Free Hospital and medical officer to Maltings Farm Sanatorium, she was for a time resident at the C.E.Z.M.F. Hospital in Quetta. In 1914 she obtained the M.D. Lond. in medicine and during the war she was one of the civilian physicians attached to the Military Hospital, Endell-street, and medical officer to a T.N.T. filling factory. In 1915 she was appointed assistant physician to the South London Hospital for Women, and from 1926 to her death she was senior physician to this hospital. After the war Dr. Thackrah became specially interested in the treatment of functional nervous disorders and for sixteen years was psychologist to Dr. Barnardo's Girls' Village Home. She will be remembered by those who knew her well for her wisdom, loyalty, kindness, and understanding.

ALEXANDER McC. D. MONYPENY, M.B., B.Ch. Belf.

THE death occurred last month under pathetic circumstances of Dr. Alexander McC. D. Monypeny at his residence in Belfast. He was only 33, and his decease followed unexpectedly upon a chill which developed into pneumonia.

Graduating in 1927 at the University of Belfast, he spent a year in the Royal Victoria Hospital, Belfast, and on the death of his father, who was a well-known and much respected practitioner in Belfast, he succeeded to the practice. From the first he showed himself to be possessed of no ordinary ability, but to have a natural gift for his chosen work.

A personal friend writes: "Alec Monypeny had many friends and intimates. He attracted one to him by his generous and kindly nature. Considering how hard he worked and how few holidays he enjoyed it was remarkable how much he had seen and done. He was well-read and had a wide knowledge of affairs which made him a delightful companion and a resourceful friend. He was tireless in his energy and conspicuous among his patients for his kindly and understanding nature; nothing was too much trouble for him where their welfare was concerned, and rich and poor alike, he held the same high reputation with both. He took special pains to keep himself abreast of the progress of medical knowledge, and at the time of his death had already extended his practice to become one of the foremost in the city. His memory will remain dear to all who knew him and to those who were privileged to share his friendship."

JAMES ERNEST LONG, M.D.Brux., M.R.C.S. Eng.

Dr. James Long, who died in December last, led a notable career as a medical missionary. Born in 1874, a member of a well-known Bath family, he was educated at King Edward's School, Bath, and Trowbridge High School, and started his career in a well-known pharmaceutical business. Determining to enter the medical profession, he became a student at the Bristol medical school, and took the English double qualifications in 1898, subsequently graduating as M.D. Brux. He held house appointments, on both the surgical and medical sides, at the Bristol General Hospital, and was for a time house surgeon at the Torbay Hospital. He then started in private practice at Weston, commencing at the same time his strenuous work as a lay evangelist. While attending to his practice he found time for extensive parochial work, and over a long period was an effective speaker at many religious gatherings, urging upon large audiences the responsibilities of the practical Christian life. On the outbreak of the war he joined up immediately, and during his service in England and later abroad he continued his double function as doctor and missionary. About sixteen years ago he felt a special call to prosecute this work in India. There he travelled up and down the country going into the remotest parts, and while carrying on his religious work rendered medical aid to the Indians, especially in urgent cases, while frequently he replaced the medical officers at hospitals, thus giving them an opportunity of a much needed holiday. He journeyed with his car, and a medical van, into many remote parts of the Empire, where the natives may have seen a white man for the first time, and the value of his beneficent energies was universally and warmly recognised, while throughout he paid his own expenses.

On his return from India, obviously broken in health, he continued to devote himself to his Evangelising work in this country and he collapsed and died suddenly at a religious meeting.

THOMAS GOODALL NASMYTH, M.D., D.Sc., F.R.C.P. & S. Edin., D.L.

THE announcement is made of the death, after a short illness, at the age of 81, of Dr. T. G. Nasmyth, whose name has been associated for many years with the progressive side of public health in east Scotland. Up to the time of his death he was closely connected with the conduct of hospital and public health matters in Edinburgh. A native of Fife, he graduated as M.B., C.M. in 1876, obtaining the degree of D.Sc. (public health) in 1887 and M.D. in 1889. He took the D.P.H. Camb. in 1886, and obtained the F.R.C.S. Edin. in 1910. In 1913 he was elected F.R.C.P. Edin. After some years spent in general practice, he was appointed M.O.H. for Fife, Kinross, and Clackmannanshire, a post which he held for 20 years, when he came to Edinburgh, where he found many outlets for his activity. He entered the town council in 1921, served for a term as a magistrate, and took a keen interest in the public health services of the city, being at the time of his death chairman of the Royal Maternity and Simpson Memorial hospital, convener of the medical committee of the Deaconess hospital, vice-chairman of the Royal Dick Veterinary College and of the Board of the Animal Diseases Research Association. He was also a member of various consultative committees of the Scottish Department of Health, a director of the Highland and Agriculture Society of Scotland, and of the Scottish National Housing Company, while he gave evidence before various committees of the House of Commons on Miners' Eight Hours Day, Miners' Diseases, and Death Certification. He wrote many papers on medical, surgical, and public health questions, and was the author of one book,

"The Kingdom: Its Characteristics and Distinguished Sons." He was a J.P. for Fife, and a D.L. of the City of Edinburgh.

As will be gathered from this list of activities Dr. Nasmyth was endowed with a fine constitution and inexhaustible activity of both mind and body, which, combined with his keen business capacity, enabled him, even in his later years, to take an important place in the work of the community, and to lead a life full of interest and usefulness up to the end of his 81 years. He is survived by Mrs. Nasmyth and one daughter.

GEORGE PICKLES ALDERSON, M.B., Ch.B. Vict.

THE death occurred early in January of Dr. George Pickles Alderson, a well-known medical practitioner at Turton, where he spent the greater part of his professional life. He received his medical education at the University of Liverpool and graduated as M.B., Ch.B. Vict. in 1899. He served for a time as house physician at the Royal Infirmary, Liverpool, before establishing himself in practice at Turton, where he became prominent through his professional and public activities. He was for twenty years a member of the borough council and chairman of various subcommittees, and in 1925 was appointed J.P. for the county of Lancashire. During the latter part of his life he gave up a good deal of his private practice, but he retained several official positions, while his medical practice was continued by his son-in-law, Dr. James Cumming. He was always particularly active on the county magistrates' bench, where a sound judgment and genial disposition made him a valuable colleague. He was very much interested in probation work and in the activities of the Juvenile Court. Apart from his medical and public work, Dr. Alderson was well known for his interest in pigeons, was a leading member of the Manchester Flying Club, and owned at different times many prize-winning birds.

CHARLES JAMES MILLIGAN, L.R.C.P., L.R.C.S. Edin., D.P.H. Belf.

THE death took place on Jan. 8th at his house in Ligoniel, Belfast, of Dr. Charles Milligan, whose connexion with the medical profession in Belfast had lasted for almost half a century. He received his medical education at Edinburgh, and qualified in 1888 as L.R.C.P., L.R.C.S., and immediately started in practice in Ligoniel. He was appointed dispensary doctor of the district 45 years ago, gained an extensive connexion, and held a high place in the affections of a wide circle, which was exemplified when, some 20 years ago, on his recovery from a serious illness, the residents in his own district joined with friends in all parts of Belfast in presenting him with an illuminated address. He retired from his private practice on his appointment as medical officer of health under the Belfast and Castlereagh Rural Council, an appointment which was terminated by his superannuation last year.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Reassembly after Christmas Recess

THE House of Commons reassembled on Tuesday, Jan. 19th, after the Christmas recess.

QUESTION TIME

TUESDAY, JAN. 19TH

Industrial Health Research

Mr. WILFRID ROBERTS asked the Home Secretary if any further report had been received from the Industrial Health Research Board with regard to the effects of noise on the health of the worker.—Sir JOHN SIMON replied: I am informed by the Medical Research Council that they have not received any further report on the subject from the Industrial Health Research Board, but that investigations are still proceeding. I understand that great difficulty is being experienced in finding suitable opportunities or methods for detecting and measuring any effects which noise may have on the workers.

Miners and Silicosis

Mr. JAMES GRIFFITHS asked the Home Secretary the number of applications for certificates of disablement received by the medical board under the Various Industries (Silicosis) Schemes from among coal miners in South Wales in the year ended Dec. 31st, 1936; the number of certificates granted; the number of applications rejected; and the number of applications and certificates granted to anthracite miners in South Wales in the same period.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: The number of applications for certificates of disablement from coal miners in South Wales during the year was 552. Certificates were granted in 268 cases and refused in 253 cases. Of the applications 311 were from anthracite miners of whom 182 were certified and 115 refused.

Mr. GRIFFITHS asked if the hon. gentleman was not aware that these men who had been refused certificates were all disabled in consequence of having inhaled dust in their occupation. He asked if the Government proposed to bring forward a measure to give elementary justice to men who had laid down their lives for their work?

Mr. LLOYD said that the fact that a man was not certified under this procedure did not necessarily prove that he suffered from an occupational form of respiratory disease. He might be only suffering from a form of respiratory disease, which might not be due to his employment.

Mr. GRIFFITHS asked when the report of the Government Committee appointed two years ago to go into this question could be expected?

Mr. LLOYD said that the Pulmonary Diseases Subcommittee of the Council recently held a meeting and decided that in the first instance it must come to a conclusion about the essential nature of diseases, other than silicosis, from which miners suffered. As a result they had arranged for clinical and radiological tests on the subject.

Physical Training in Schools

Mr. SEXTON asked the President of the Board of Education whether he would give special consideration to the institution of a short specialised course of physical training for unemployed teachers to enable them to obtain employment as instructors in schools, thus assisting in the Board's activities in improving the physical welfare of the pupils and at the same time giving hope to a body of young men and women who had already undergone a course of training in the training colleges.—Mr. GEOFFREY SHAKESPEARE, Parliamentary Secretary to the Board of Education, replied: There are already a number of courses of varying duration in physical training for teachers who have left the normal training colleges and who may or may not have obtained posts, and it is proposed to increase the number of these courses. I do not think that the number of teachers who remain long out of employment after leaving the training colleges would be sufficient to justify special courses for them.

Physical Condition of Monmouthshire School-children

Mr. JOHNSTON asked the President of the Board of Education whether his attention had been called to the physical condition of the children in the boys' school at Blaina, Monmouthshire, where the head master had reported that 50 per cent. of his pupils were undersized and underfed, poorly clad, and badly shod; and, seeing that only 18 per cent. received free milk, and that the grants to the Monmouthshire education authority were insufficient to provide adequate necessities, what steps he proposed to take in the matter.—Mr. GEOFFREY SHAKESPEARE replied: My attention has been called to the physical condition of the children in the boys' school at Blaina, which is not satisfactory, though on my present information I cannot fully accept the head master's statement. I should welcome increased provision of free milk in this and other schools in Monmouthshire, but I understand that this provision is restricted by the severe income scale at present in force. This question has recently been discussed with representatives of the local education authority, and I understand that the authority are considering the question of introducing a more generous income scale.

Mr. JOHNSTON asked whether, if the hon. gentleman could not accept the head master's statement on the matter, he was not prepared to accept the statement made by two of the medical officers of health of the county who re-examined these children in January of this year and discovered that children of 15 were, on an average, 16 lb. under weight, and that 40 of the boys were sitting in school with damp feet, and that there was poverty and despair all over the district?

Mr. SHAKESPEARE said his attention had been called to that report, which did not bear out the statement of the head master. He understood that a fund had been raised to provide boots for the children.

Mr. JOHNSTON asked if the hon. gentleman was not aware that the official inquiry showed that the condition of affairs was worse than in the original statement made by the head master?

Mr. SHAKESPEARE said that it did not approximate at all to the statement of the head master.

Inspection of Offices by Local Authorities

Mr. SHORT asked the Minister of Health whether he had yet circularised local authorities calling attention to the provisions of the Public Health Act, 1936, respecting the conditions of offices and the need for periodical inspection; and, if so, what had been the nature of the response.

Mr. HERBERT WILLIAMS asked the Minister of Health what steps were being taken by local authorities under the provisions of the Public Health Act, 1935, to ensure that the provisions of the Act in respect of offices were effectively enforced.—Sir KINGSLEY WOOD replied: A circular drawing the attention of local authorities to their powers and duties under the Act in respect of offices is in course of preparation and will be issued well in advance of Oct. 1st next, the date on which the Act comes into force.

PUBLIC HEALTH

Vital Statistics for 1936

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infant mortality for the year 1936.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales ..	14·8	12·1	59
122 county boroughs and great towns, including London	14·9	12·3	63
143 smaller towns ..	15·3	11·7	55
London (administrative county)	13·7	12·5	66

The smaller towns are those with estimated resident populations of 25,000–50,000 at the 1931 census.

Note.—The birth- and death-rates for England and Wales as a whole are calculated on the estimated mid-*1936* population, those for the towns aggregates and for London on the estimated mid-*1935* populations. The birth-rate is based on live births, the death-rate on crude deaths.

The birth-rate for 1936 is 0·1 per thousand above that for 1935 and is 0·4 above that of 1933, the lowest recorded. The crude death-rate is 0·4 above that of 1935 and 0·7 above that of 1930, the lowest on record. The infant mortality-rate is 2 above that of 1935, which was the lowest recorded, and is the same as that of 1934, the previous lowest record. The rates are provisional and are issued for the information of medical officers of health, but they are not likely to require substantial modification.

Influenza

The Ministry of Health has again speeded up the weekly return. In the great towns of England and Wales 1100 deaths from influenza were reported during the week ended Jan. 16th. The graph, it will be seen, still closely follows that for the epidemic of 1932–33 and must disappoint those who were led to believe that the peak of the epidemic was reached a week ago. There is however now some indication that it will not reach the level of the 1933 peak. In any case it should be borne in mind that there is a lag of 10–14 days in the graph of deaths behind the graph of onsets and the deaths must continue to rise for some time after the epidemic has begun to wane.

The impression of general mildness in the attacks is confirmed by the age-distribution of the 768 deaths in the week ending Jan. 9th.

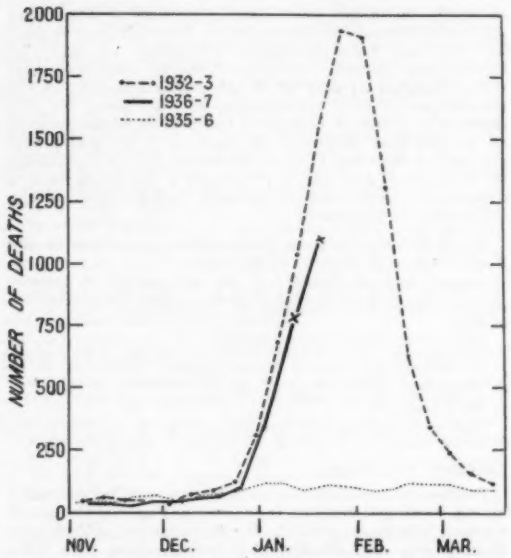
Ages.	Deaths.	Percentage of total.
0–24	47	6·1
25–44	92	12·0
45–64	262	34·1
65 and over ..	367	47·8
All	768	100·0

These figures show no movement towards the heavy mortality of young adults in the epidemic of 1918.

We cannot yet give any precise up-to-date figures for the distribution of deaths over different parts of the country, but a topographical analysis of the 768 deaths from influenza reported in the week ended Jan. 9th confirms the great preponderance already noted in the south-eastern area. Of the total, 311 occurred in London and 574 in Greater London. The numbers in the Outer Ring were (in diminishing order): Willesden 23, West Ham 19, Ealing 16, Croydon 10, Tottenham 9, Heston and Isleworth, Hornsey each 8, Hendon, Wembley each 7, Acton, Brentford, Leyton, Wimbledon each 6, Edmonton 5, Beckenham, Southgate, Wood Green each 4, Enfield 3, Tottenham 2, Barking, Mitcham each 1. Finchley (with 62,660 inhabitants) was the only town in the Outer Ring which reported no death. Outside London the number of deaths (in diminishing order) was as follows: Glasgow 33, Bradford 25, Leicester 24, Birmingham 22, Belfast 17, Bristol 16, Edinburgh and Leeds 13, Nottingham 12.

In the absence of any exact regional figures for last week from the Registrar-General's department we may record the impression gained from reports which have reached us that the epidemic remains substantially the same in quantity and quality, although abating in some localities and increasing in others. In London the admissions to L.C.C. hospitals have dropped from 1600 to 900; the

character of the attacks has not altered. The deaths in London rose from 311 to 344 in the week ending Jan. 9th, a large proportion being in old people. In Brighton the position is unchanged except that bronchitis and otitis media are becoming more frequent complications. Last week influenza reached Devon; the cases there are running a short course mostly of the cerebral and/or respiratory type with some gastro-enteritis—the duration two to three days, and only a short period of depression following; no serious complications. In Wales there has been a sharp attack at Holyhead, the worst experienced since 1918, but of a type not serious to young people; schools and local places of amusement have been closed for the time. In the north also the disease



Graph showing total deaths from influenza in the Great Towns on the last day of each week in three different years.

has spread somewhat but still in mild form. At Bridlington, contrary to the rule, about half of the school-children seem to have been affected. In the Newcastle district there has been a good deal of catarrhal bronchitis but no other complications, and the deaths are not unusual for the season. A report that half the inhabitants of Holy Island were stricken has proved on investigation to mean that, while coughs and colds are evident in nearly every member of the community of 200 persons, no one actually was very ill. In Scotland the highest incidence has been in Glasgow where the deaths have been the highest recorded since 1929. In Edinburgh the attack rate remains the same, and few children have been affected. But even the remotest parts of Scotland report inconvenience, especially among light-house keepers. In Dublin there has been no extensive outbreak, and few patients have sought hospital treatment. The type is not severe, the usual symptoms being headache, muscular pains, respiratory catarrh, and brief pyrexia. There is also in the city a good deal of severe bronchitis accompanied by tracheitis, apparently unrelated to influenza as there is no myalgia or headache, and the attack is not followed by depression. In Belfast the worst is reported over and in Cork the epidemic is said to be subsiding.

"PLUS ÇA CHANGE . . "

the more influenza remains the same. In our issue of Jan. 21st, 1837, it is remarked that "the prevailing epidemic has become of so serious a character that we . . . have felt it to be our duty to place on record a description of the malady as it has appeared in the district in which the office of THE LANCET is situated." The surgeon of the parochial infirmary was able to give a statement week by week of patients receiving medical relief for the eastern division of St. Clement Danes, the numbers suffering from influenza rising from 25 to 98 between December and January. "At no period," it is said, "have so many persons been invalided in this locality, and never has disorder of the animal functions been so general among the inhabitants." A comparison is made with the "typhus fever which raged in the same district during a portion of the last spring . . . and although much more formidable *per se*, was less dangerous in its complications." The influenza affected persons of all habits, rarely children until the epidemic was well advanced. Milder forms of the complaint consisted of sneezing, nasal discharge, sense of pressure and fullness at the frontal sinuses, with headache and some degree of lassitude. "These symptoms induced but very few to seek medical advice; professional assistance, indeed, was . . . neglected until the full establishment of the disease . . . almost invariably indicated by the occurrence of cold shivers" followed by pains in the head and limbs, hoarseness, cough, and prostration. In several cases the disorder extended to members in the same family or house. Uncomplicated cases however severe were not dangerous, but when the disorder supervened on bronchitis death from "asthenic congestion of the lungs" was likely to occur. A fortnight later a leading article sums up the outbreak which was then on the decline. There is nothing about the symptoms and little about the treatment to distinguish it from present-day practice. "In every instance, and at all times, it evinced itself as a fever, *sui generis*, never, even in its earliest stage, to be cut short by treatment, as a common cold, though capable, by judicious management, of being rendered, in its subsequent progress, much more mild"—a sentence which (minus perhaps some commas) might have been written to-day. The causation is summed up in the following words: "So far as enquiry has enabled us to form a judgment, the disease is produced by some infectious poison, gaseous or miasmatous, suspended in the atmosphere, favoured, perhaps, in its transmission from place to place by moisture, and promoted in its reception . . . by the action of cold debilitating the parts to which the poison is applied." But in a later article THE LANCET definitely hardened against the idea of influenza being propagated by contagion. "The unexampled rapidity with which it has overrun localities, and even kingdoms, renders it impossible to allow the assumption of transmission from one human body to another." Nevertheless the interesting fact is recorded that one European State put British ships in quarantine for it.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 9TH, 1937

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1617; diphtheria, 1258; enteric fever, 34; pneumonia (primary or influenzal), 2333;

puerperal fever, 33; puerperal pyrexia, 133; cerebro-spinal fever, 34; acute poliomyelitis, 5; encephalitis lethargica, 5; dysentery, 37; ophthalmia neonatorum, 88. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals for the London County Council on Jan. 15th, 1937, was 3898, which included: Scarlet fever, 895; diphtheria, 1033; measles, 14; whooping-cough, 548; puerperal fever, 16 mothers (plus 5 babies); encephalitis lethargica, 284; poliomyelitis, 2. At St. Margaret's Hospital there were 14 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In 122 great towns, including London, there was no death from small-pox, 1 (1) from enteric fever, 7 (1) from measles, 5 (1) from scariet fever, 21 (9) from whooping-cough, 50 (13) from diphtheria, 31 (12) from diarrhœa and enteritis under two years, and 768 (311) from influenza. The figures in parentheses are those for London itself.

Hull and Swansea each had two deaths from measles, Manchester 2 from whooping-cough. Fatal cases of diphtheria were reported from 24 great towns, Liverpool 7, Manchester 4, St. Helens 3.

The number of stillbirths notified during the week was 261 (corresponding to a rate of 37 per 1000 total births), including 41 in London.

MEDICAL NEWS

University of Cambridge

The chair of physiology at the University will fall vacant on the retirement of Sir Joseph Barcroft at the end of September. Candidates for the chair should communicate with the vice-chancellor before Feb. 20th.

The title of degree of B.Chir. has been conferred on M. P. Shackle and W. F. Young.

Dr. D. V. Davies and Dr. W. R. M. Morton have been appointed university demonstrators in anatomy for three years.

University of London

At recent examinations the following candidates were successful:—

D.P.H.

Part I.—J. K. Adranvala, D. M. Blair, Kathleen G. Brimelow, Joyce M. Brockington, P. N. Chatterjee, A. B. Christie, Kitty K. Conrad, J. S. Cookson, Teresa I. M. Craig, Iris M. Cullum, C. F. Cumings, B. K. De Silva, Samuel Graham, Eva M. Gray, H. F. Green, R. M. M. Hunter, J. D. Lendrum, S. E. D. Masilamani, B. B. Mukerjee, Douglas Murray, A. F. S. Perera, Violet M. Spiller, T.-S. Sze, J. W. P. Thompson, A. F. Turner, H. M. van der Wall, Sarah C. B. Walker, L. A. F. Wiles, and Isabel A. M. Woods.

University of Aberdeen

Dr. John Stirling Young, professor of pathology in the Queen's University, Belfast, has been appointed to the chair of pathology in the University in the place of Prof. Theodore Shennan who has resigned.

Dr. Young graduated in arts at the University of Glasgow in 1919, and B.Sc. in 1921. He took his medical degree with honours in 1923, and a year later was appointed assistant in the pathology department of the University of Glasgow and assistant pathologist at the Western Infirmary. In 1927 he went to Leeds as reader in experimental pathology and assistant director of cancer research at the university. Two years later he was awarded the Bellahouston medal for his M.D. thesis. In 1932 he took up his present position. During the war Dr. Young served with the 8th Cameron Highlanders, and later as captain and adjutant in the Black Watch. He was awarded the Military Cross. His contributions to pathological journals include studies of hyperplasia and metaplasia produced experimentally.

Royal College of Surgeons of England

A meeting of the council was held on Jan. 14th, with Sir Cuthbert Wallace, the president, in the chair. A resolution of condolence was passed on the death of Sir John Bland-Sutton, formerly president of the College. The Hallett prize was presented to Mr. Robert Evan Owen Williams, of University College Hospital. The president was elected to represent the College at the forthcoming Coronation ceremony. Dr. John Beattie, conservator of the museum and director of research, was appointed representative of the College on the Huxley memorial lecture committee. Sir Arthur Keith, F.R.S., was reappointed as the representative of the College on the joint committee of anthropological research and teaching of the Royal Anthropological Institute. Mr. Eardley Holland was appointed to represent the College on the Central Midwives Board. Mr. L. R. Braithwaite was reappointed to the medical advisory committee of the British Health Resorts Association.

The council entered into a contract with Messrs. Higgs and Hill for the rebuilding of the upper floors of the College for the new Bernhard Baron research laboratories. The council gratefully received a gift of £25 from Mr. Walter Radcliffe, M.R.C.S., for the purpose of cancer research, and a gift from Lord Moynihan of Leeds and Almina, Countess of Carnarvon, of the instruments used by the late Lord Moynihan at Alfred House. The Cheltenham General and Eye Hospital was recognised under Sections 21 and 23 of the regulations relating to the education and examination of candidates for the diploma of fellow in respect of the post of house surgeon at the General Hospital. A diploma of fellowship was granted to Reginald George Worcester, of the University of Melbourne and St. Bartholomew's Hospital, and a diploma of membership to Bernard Joseph Green, of the University of Liverpool.

The following diplomas were granted jointly with the Royal College of Physicians of London:—

Diploma in Public Health.—R. M. Campbell, A. B. Donald, P. J. Doody, M. S. A. Hamid, Enid A. Hughes, Vida L. Liddell, Clement Muir, Kulaveerasingham Somaskander, and H. E. Stevens.

Diploma in Psychological Medicine.—K. C. Bailey, B. P. Bhattacharjya, C. M. Carlyle-Gall, L. A. Collins, J. G. Dewan, D. S. Fairweather, Hunter Gillies, Lilian A. Hayward, B. H. Kirman, E. H. Kitching, A. R. McPherson, M.L. Meade-King, T. A. Ratcliffe, D. E. Sands, W. W. Sargant, A. S. Thorley, and D. B. Watson.

Diploma in Laryngology and Otology.—D. L. Brown, C. W. Dixon, Narendranath Dutt, G. A. Jamieson, and R. N. Misra.

Lectures in Geology

Twelve Swiney lectures on Ice Ages will be delivered by Mr. Frederick Walker, D.Sc., at the Imperial College of Science, Exhibition-road, South Kensington, on Mondays, Wednesdays, and Fridays at 5.30 P.M., from Feb. 26th to March 24th. Admission will be free.

Society of Public Analysts

On Wednesday, Feb. 3rd, this society is holding a joint meeting with the food group of the Society of Chemical Industry at the rooms of the Chemical Society, Burlington House, Piccadilly, W. There will be two sessions, one at 5.15 P.M. and another at 8.15 P.M., which will be devoted to a discussion on the less-known constituents of milk and their examination.

Laboratory for Testing Food

On Jan. 19th Sir William Bragg, P.R.S., opened an extension of the joint laboratories at Holloway of the British Association of Research for the Cocoa, Chocolate, Sugar Confectionery, and Jam Trades and of the British Food Manufacturers' Research Association. The laboratories were founded 15 years ago and the Government has contributed £50,000 and the members of the trade about £110,000 towards the cost.

Royal Sanitary Institute

A meeting of the institute will be held in the Town Hall, Halifax, on Friday, Feb. 12th, at 4.45 P.M., when Mr. J. Pollard, M.R.C.V.S., will open a discussion on milk and dairies legislation, and Mr. J. W. Beaumont, a discussion on housing past, present, and future. Visits will be made to the water-purification plant, the new flats for working-class women, the disinfestation plant, and the new isolation hospital, where a short address on the future of the isolation hospital will be given by Dr. G. C. F. Roe, medical officer of health for Halifax.

Sir Ernest Graham-Little has been elected an honorary member of the Polish Dermatological Society.

St. Mary Abbots Hospital, Kensington

On Jan. 15th the Bishop of Kensington opened a new operating theatre unit and an X ray department at this hospital. A new underground service subway connects the new buildings with the hospital and enables patients to be conveyed under cover to the new theatre and X ray units. The extensions have cost about £13,500. Among those present was Miss Esther Rickards, F.R.C.S., chairman of London County Council hospital management sub-committee, who said since 1934 ten new operating theatres and X ray departments had been opened in London County Council hospitals.

New Readerships at Leeds

Our Leeds correspondent writes: "The two new posts of reader in medicine and reader in surgery which are being instituted by the University should prove very attractive. The duties are intended to be those of research in the two subjects, and especially of the correlation of clinical and laboratory methods. It is suggested that applicants should not be more than 35 years of age and it is indicated that preference will be given to those candidates who possess either the membership of the Royal College of Physicians of London or the fellowship of the Royal College of Surgeons of England. The salaries offered are £600 a year. The duties will include a considerable amount of teaching and this is especially necessary in view of the increase in the number of students. Application has been made to the board of the Infirmary for the granting of facilities to the holders of the two posts to carry out the clinical parts of their duties within its walls and this has been readily granted."

Child Guidance Council

The third biennial child guidance inter-clinic conference will be held on Jan. 29th and 30th at Friends House, Euston-road, London, N.W., and at B.M.A. House, Tavistock-square, W.C., which is near by. The secretary of the council, Dr. D. R. MacCalman, may be addressed at Woburn House, Upper Woburn-place, W.C.

The council have also arranged a vacation course on child psychology which will be held from March 31st to April 9th at Berridge House, Fortune Green-road, London, N.W. The programme will include lectures on: normal emotional growth and its bearing on good mental health (Dr. J. R. Rees, Dr. Henry Wilson, Dr. Grace Calver); clinical experience in dealing with behaviour difficulties (Dr. William Moodie, Dr. D. R. MacCalman, Dr. Hamilton Pearson); and intellectual development and its relation to problems of learning (Miss L. G. Fildes, Mrs. Susan Isaacs, Miss M. MacTaggart, and Miss C. Simmins). Further particulars of this course may also be had from the secretary.

Schrötter's Centenary

On Jan. 30th the University of Vienna and the Vienna Rhino-laryngological Society are to celebrate the centenary of Leopold von Schrötter, who was born on Feb. 5th, 1837. He was one of the great pioneers of the specialty, and the results of his researches and methods still have a place in modern laryngology. Schrötter was the founder and first chief of the University laryngological clinic in Vienna, the first specialist clinic in the world. He was also one of those who began the modern campaign against tuberculosis. At Alland, near Vienna, he founded the first climato-dietetic establishment for tuberculous patients, and this became a model for all similar institutions. In the Arkadenhof of the University a marble memorial tablet with a medallion of Schrötter by Prof. L. R. von Zumbusch, will be unveiled. Prof. Arzt, the rector of the University, Prof. Wilhelm Kerl, the dean of the medical faculty, Prof. Josef Sorgo as a late pupil and assistant of Schrötter, and Prof. Hermann Marschik as laryngologist and president of the Vienna Rhino-laryngological Society, will pay tribute to the great man. Replicas of the medallion and further particulars may be obtained from Prof. M. Weinberger, Wien IV. Brucknerstrasse 4.

Congress in Algiers

The eighth Congrés International de Hautę Culture Médicale will be held in Algiers from March 25th to April 6th. The work of the congress will be divided into six sections: infectious tropical and subtropical diseases (president, Senator Maragliano, Genoa); syphilis and dermatology (presidents, Prof. Milian and Prof. Levaditi, Paris); cardiovascular diseases (president, Prof. Laubry, Paris); hæmatology; general medicine; and social medicine (president, Dr. Hazemann, Paris). During the congress a meeting will be held to pay tribute to the work of Laveran, Manson, Ross, Marchiafava, Golgi, Celli, and Grassi, at which Prof. Brumpt (Paris), Dr. Sergent (Algiers), Dr. Manson-Bahr (London), and Mme. Celli will take part. Until March 5th Mr. L. W. Tomarkin, the organiser, may be addressed at the Institut Alfred Fournier, Boulevard Saint Jacques 25, Paris, and afterwards care of the Gouvernement Général de l'Algérie, Alger.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Jan. 25th.

Odontology. 8 P.M. Mr. E. Vaughan Tomey: Therapeutics of Daily Practice. Dr. Victor Goldman: Vinyl Ether as a Dental Anæsthetic.

TUESDAY.

Medicine. 5 P.M. Prof. Bruce Perry: Course and Management of Congenital Heart Disease. Dr. Terence East, Dr. C. Muir, and Dr. J. W. Brown will also speak.

WEDNESDAY.

Comparative Medicine. 5 P.M. Discussion: Prof. L. S. P. Davidson, Major C. Davenport, and Major D. S. Rabagliati: Purpuric Conditions in Man and Animals.

THURSDAY.

Urology. 8.30 P.M. Mr. W. D. Doherty: The Urological Complications of Diverticulitis. Mr. W. E. Underwood: Recent Observations on the Pathology of Hydronephrosis.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, Jan. 25th.—8.30 P.M., Dr. John Beattie and Prof. John Ryle: Value of Experimental and Laboratory Training in Medical Education.

MEDICO-LEGAL SOCIETY.

THURSDAY, Jan. 28th.—8.30 P.M. (Manson House, 26, Portland-place, W.), Mr. H. E. Cox, D.Sc.: Some Forensic Aspects of Dermatitis.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.

Fever Hospital Medical Services Group.

FRIDAY, Jan. 29th.—4 P.M., Dr. James Anderson, Dr. Robert Cruickshank, and Dr. Maurice Mitman: Acute Enteritis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, Jan. 25th.—5 P.M., Dr. S. Zuckerman: Tissue Specificity in Relation to Sex Hormones.

WEDNESDAY.—5 P.M., Dr. Zuckerman: The Inter-relation of Endocrine and Neurovascular Factors in the Menstrual Cycle.

FRIDAY.—5 P.M., Mr. C. P. G. Wakeley: The Surgery of the Parapituitary Region. (Hunterian lectures.)

UNIVERSITY OF LONDON.

MONDAY, Jan. 25th.—5 P.M. (University College, Gower-street, W.C.), Mr. H. R. Ing, D.Sc.: Chemical Structure and Pharmacological Action. (First of six lectures.)

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY, Jan. 25th.—2.30 P.M., Dr. H. MacLean: Nephritis and Allied Conditions.

TUESDAY.—2 P.M., Dr. J. Gray: Pathology of the Liver.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical). 4.30 P.M., Mr. A. S. Parkes, F.R.S.: Experimental Endocrinology.

THURSDAY.—Noon, clinical and pathological conference (obstetrics and gynæcology.) 2.30 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Dr. A. A. Moncrieff: Hygiene of the Fœtus and the New Born Child.

FRIDAY.—2 P.M., operative obstetrics. 2.30 P.M., Mr. W. B. Gabriel: Surgical Diseases of the Rectum. 3 P.M., department of gynæcology, pathological demonstration.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.6.
MONDAY, Jan. 25th.—10 A.M., skin clinic. 11 A.M., surgical wards. 2 P.M., operations, surgical and gynæcological wards, medical, surgical, and gynæcological clinics. 4.15 P.M., Mr. Green-Armytage: The Unexpected in Normal Labour.
TUESDAY.—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., operations, medical, surgical, and throat clinics. 4.15 P.M., Dr. R. W. Ironside: Complications of Anæsthesia.
WEDNESDAY.—10 A.M., children's ward and clinic. 11 A.M., medical wards. 2 P.M., gynæcological operations, medical, surgical, and eye clinics. 4.15 P.M., Mr. H. P. Gibb: Demonstration of Eye Cases.
THURSDAY.—10 A.M., neurological and gynæcological clinics. Noon, fracture clinic. 2 P.M., operations, medical, surgical, and genito-urinary and eye clinics. 4.15 P.M., Dr. W. S. C. Copeman: Chorea and Still's Disease.
FRIDAY.—10 A.M., medical wards, skin clinic. Noon, lecture on treatment. 2 P.M., operations, medical, surgical, and throat clinics. 4.15 P.M., Mr. Grant Batchelor: Surgical Lecture.
SATURDAY.—10 A.M., children's and surgical clinic. 11 A.M., medical wards.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Jan. 25th, to SATURDAY, Jan. 30th.—ST. JOHN'S HOSPITAL, Leicester-square, W.C., afternoon course in dermatology (open to non-members).—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W., Tues., 8.30 P.M., Mr. R. C. Brock: Thorax: Thurs., 8.30 P.M., Mr. Hamilton Bailey: Testicle and Prostate.—ST. PETER'S HOSPITAL, Henrietta-street, W.C., all-day advanced course in urology.—BROMPTON HOSPITAL, S.W., all-day course in chest diseases.—Courses arranged by the fellowship are open only to members.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Jan. 25th.—3.30 P.M., Mr. Elmquist: Demonstration of Re-educational Methods.
TUESDAY.—3.30 P.M., Dr. Denny-Brown: The Nervous Control of the Sphincters.
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Mr. Jefferson: Head Injuries.
FRIDAY.—3.30 P.M., Dr. Walshe: Disseminated Sclerosis.
Out-patient clinic daily at 2 P.M.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Jan. 28th.—2 P.M., Dr. B. E. Schlesinger: Glandular Therapy. 3 P.M., Dr. A. Signy: The Use of Vaccines and Sera.
Out-patient clinics daily at 10 A.M., and ward visits at 2 P.M.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY, Jan. 28th.—3 P.M., Prof. Golla: Clinical Demonstration.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.
TUESDAY, Jan. 26th.—5 P.M., Dr. L. Forman: Sycosis.
THURSDAY.—5 P.M., Dr. W. K. Sibley: Electrotherapeutics.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Jan. 29th.—4 P.M., Mr. A. Lowndes Yates: The Treatment of Early States of Deafness.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY, Jan. 29th.—4.30 P.M., Mr. H. J. Taylor, Ph.D.: The Physical Basis of Methods of Treatment in Rheumatic Diseases.

LEEDS GENERAL INFIRMARY.
TUESDAY, Jan. 26th.—3.30 P.M., Dr. Hellier: The Diagnosis of Eczema in Relation to Treatment.

ST. MARY'S HOSPITALS, Manchester.
THURSDAY, Jan. 28th.—4.15 P.M. (Whitworth-street West Hospital), Dr. C. P. Lapage: Diseases of the Newborn.

GLASGOW POST-GRADUATE ASSOCIATION.
WEDNESDAY, Jan. 27th.—4.15 P.M. (Eye Infirmary), Mr. W. B. Inglis Pollock: Glaucoma.

Appointments

COOKE, W. T., M.B. Camb., M.R.C.P. Lond., has been appointed Resident Medical Registrar at the Queen's Hospital, Birmingham.
EVANS, C. F., F.R.C.S. Eng., Senior Resident Medical Officer at The King Edward Memorial Hospital, Ealing.
HAILWOOD, J. G., M.D. Liverp., Medical Registrar and Tutor at the Royal Liverpool Children's Hospital.
KING, E. F., M.B. Brist., F.R.C.S. Eng., D.O.M.S., Hon. Ophthalmic Surgeon to the Putney Hospital.
LYLE, J. S., M.B., F.R.C.S. Edin., Senior Resident Surgical Officer at the Royal Infirmary, Perth.
MCGREGOR, H. G., M.D., M.R.C.P. Lond., Hon. Medical Registrar at the Royal Sussex County Hospital, Brighton.
MULVANY, D. F., M.B. Lond., F.R.C.S. Eng., Surgical Registrar at the Hospital of St. John and St. Elizabeth, London.
NEILL, J. H., M.B. Glasg., Hon. Anæsthetist to the Gloucestershire Royal Infirmary, Gloucester.
STEIN, B. B., M.B., F.R.C.S. Edin., Resident Surgical Officer at the Royal Infirmary, Doncaster.
SUTCLIFFE, M. L., M.R.C.S. Eng., D.P.H., D.P.M., Medical Officer of Health for Gloucester and Newent Rural Districts and the Borough of Tewkesbury, and Assistant County Medical Officer to the Gloucestershire County Council.
WILSON, F. EDNA, M.B. Dubl., Anæsthetist at the Chelsea Hospital for Women.

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O. (I.) and (II.) = Assistant Medical Officer, Grades I. or II. D.M.O. = District Medical Officer. Temp. = Temporary.
BRIGGS, G. O., M.B. Camb., M.R.C.P. Lond., A.M.O. (I.), Grove Park;
GLOVER, F. R., M.B. Lond., A.M.O. (II.), Grove Park;
O'SULLIVAN, T. J., M.D. Dubl., D.P.H., A.M.O. (II.), Colindale;
LAWRENCE, BERYL J., M.B., House Physician, Downs;
O'LEARY, NORA, M.B., N.U. Irel., D.P.H., House Physician, High Wood;
SHEPPARD, C. L., M.B., House Physician, Downs;
COOKE, MABEL J., M.B. Lond., D.P.H., House Physician, North-Western;
GODBER, G. E., B.M. Oxon., M.R.C.P. Lond., D.P.H., House Physician, North-Western;
HARDY, ROBERT, M.B. Edin., D.P.H., A.M.O. (II.), Temp., South-Eastern;
HALL, MARJORIE K., M.B. Lond., D.P.H., A.M.O. (II.), South-Western;
MCELDOWNEY, A. P., M.A., M.R.C.S., Temp., D.M.O., Wandsworth and Putney;
HURFORD, J. V., M.D. Belf., B.Ch., M.R.C.P., D.P.H., A.M.O. (I.), Colindale;
CANN, A. M. R., M.B. Lond., D.C.H., A.M.O. (II.), Brook.

Certifying Surgeon under the Factory and Workshop Acts Dr. N. H. HARRISON (Presteign District, Radnor).

Births, Marriages, and Deaths

BIRTHS

HOWARD JONES.—On Jan. 11th, at Devonshire-place, W., the wife of Dr. Norman Howard Jones, of Gloucester-terrace, W., of a daughter.
RAU.—On Jan. 14th, at Bentinck-street, W., the wife of Dr. Leo Rau, of Highgate, N., of a son.
RENSHAW.—On Jan. 9th, at Mottram St. Andrew, Cheshire, the wife of Dr. Arnold Renshaw, of a daughter.
SCHARFF.—On Jan. 10th, at Singapore, the wife of Dr. J. W. Scharff, of a son.
WILLIAMS.—On Jan. 14th, at Guildford, the wife of Dr. Parker Williams, of a daughter.

MARRIAGES

BANNERMAN—DIAMOND.—On Jan. 16th, at St. Charles Catholic Church, Gosforth, Flight Lt. Hugh Bannerman, R.A.F. (Medical Unit), to Hilda Mary Diamond, of Gosforth.
ELWELL—LEWIS.—On Jan. 7th, at St. Mary's Church, Hornsey, N., Graham Gordon Wilmot Elwell, M.R.C.S., to Kathleen, Lewis, daughter of Mr. W. E. J. Lewis, Bromley, Kent.
HENDERSON—LONG.—On Jan. 18th, at Holy Trinity Church, Brompton, S.W., Alexander Stewart Henderson, M.B., to Ruth, daughter of the late Mr. D. A. Long, Grahamstown, South Africa, and Mrs. Long, Amersham, Bucks.
PARSONS—REMFRY.—On Jan. 16th, 1937, at Cheltenham, Clifford Gregory Parsons, M.A., M.B., M.R.C.P., son of Professor and Mrs. L. G. Parsons, of Birmingham, to Frances Honor, daughter of Mr. and Mrs. Maurice Remfry, of Cheltenham.
STUART—HAYNES.—On Jan. 9th, at Torquay, John Walter Stuart, M.R.C.S., of Elgin-crescent, W., to Loma Eleanor Shekell, daughter of Mr. Stanhope Haynes, of Torquay.

DEATHS

CRIPPS ROGERS.—On Jan. 15th, at Eastbourne, Henry Cripps Rogers, M.R.C.S. Eng., L.S.A., in his 94th year.
DAYMAN.—On Jan 13th, at Bristol, Barnfield Dayman, M.R.C.S. Eng., aged 89.
ELLIS.—On Jan. 16th, at Bearsden, Prof. David Ellis, D.Sc., Ph.D., F.R.S.E., Professor of Bacteriology and Superintendent of the Schools of Pharmacy and Bakery, the Royal Technical College, Glasgow.
HUNTER.—On Jan. 13th, William Hunter, C.B., M.D., Hon. LL.D. Edin., F.R.C.P. Lond., aged 76.
KEAYS.—On Jan. 14th, at Keynsham, Somerset, Lieut-Colonel W. Keays, R.A.M.C. (retd.), in his 87th year.
LYON.—On Jan. 16th, at Bournemouth, George Lyon, M.B. Aberd.
MCCALL.—On Jan. 12th, at Victoria-road, S.W., William McCall, M.D. Brux., L.S.A., aged 78 years.
MACWILLIAM.—On Jan. 13th, at Edinburgh, John Alexander MacWilliam, M.D. Aberd., LL.D., F.R.S., Emeritus Professor of Physiology (Univ. of Aberdeen), Cults.
MILWARD.—On Jan. 10th, at St. Mary's Hospital, Paddington, John Kenneth Milward, M.R.C.S. Eng., of Radlett, Herts.
NASMYTH.—On Jan. 16th, at Edinburgh, Thomas Goodall Nasmyth, M.D. Edin., aged 81.
WYLIE-MOORE.—On Jan. 12th, at Bexhill-on-Sea, William Andrew Wylie-Moore, M.B. Edin., formerly of Aughton, Lancs.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

A MODIFIED BILLROTH I

Dr. J. Schoemaker, professor of surgery at The Hague, gave the Hunterian lecture of the Hunterian Society at the Mansion House on Monday evening, setting out the principles and methods he had found successful in the surgical treatment of gastro-duodenal ulceration and inflammation. He began with an assurance that ulcers can be cured by medical treatment; only after failure of prolonged and regular medical treatment is it the physician's duty to hand his patient over to the surgeon. And he ended with the assurance that though the surgeon cannot cure all his patients, he can heal more than 90 per cent. of them. The surgical treatment perfected by Schoemaker is a modification of the Billroth I operation of partial gastrectomy. Though fairly radical, this aims at leaving behind a great part of the body and more than half of the greater curvature, thus impairing as little as possible the antiseptic and hæmopoietic functions of the stomach. Schoemaker claims that pernicious anæmia has never resulted from this operation. The first part of the duodenum, the pyloric antrum, and the gastric canal (the *Magenstrasse* of the Germans) are removed, quasi-normal form and function being restored by suture of the free end of the duodenum to the lower part of the cut surface of the stomach. After the operation the stomach is smaller than it was, but otherwise Schoemaker claims that it is normal. The contents are well mixed and leave slowly by an orifice that takes on some of the functions of a pylorus. Gastritis and duodenitis do not occur and the jejunum is not suddenly flooded with partially digested stomach contents, as it is after either gastro-enterostomy or the Billroth II operation. Schoemaker showed films to illustrate the normal folds of a healthy gastric mucosa after operation by his method, contrasting them with the large folds found in the inflamed mucosa after gastro-enterostomy.

There was, he suggested, some justification for regarding gastro-enterostomy as a disease. Not only did it induce the risk of gastritis and jejunitis, but it did not stop bleeding, prevent perforation, or remove the ulcer. The chance that an ulcer thus left in situ might later become malignant he regarded as too small seriously to influence the surgeon's judgment. Gastro-enterostomy had indeed a definite value in the treatment of ulcer; undertaken for stenosis it was the beginning of gastric surgery and the results had not been too bad. He performed it in cases where the patient was weak and tired out with vomiting; where he was so stout that satisfactory access to the site of operation was impracticable; and also in certain cases of very fixed ulcers of the duodenum where gastrectomy was considered too dangerous. A follow-up of gastro-enterostomies done in 1925 had shown that, ten years after operation, 60 per cent. had no stomach troubles, 20 per cent. suffered in minor degrees, and 20 per cent. had no relief or had had recurrences. No case had died as a result of the operation. On the other hand 10 per cent. of gastro-enterostomy cases required a second operation. Faced with a perforated ulcer, Schoemaker's advice to the surgeon was first to consider saving the patient's life; then if the opening was small, the interval since perforation was short, and the condition of the patient was good, partial gastrectomy was the best operation. He had been successful himself in a few such cases. For bleeding ulcer operation was not the first resort, but where bleeding recurred it must be done. The mortality was high—about 30 per cent.—but one must remember that operation was undertaken in the most serious cases, and that it was difficult.

Prof. Schoemaker showed a film of partial gastrectomy as performed by him with his special gastric clamp. His critics have pointed to the danger of leakage at the angle where the gastro-duodenal junction meets the oblique line of sutured stomach surface. Having himself had no death from leakage he regards this danger as negligible. His results in 783 cases show 82 per cent. with no complaints, 7 per cent. with minor complaints, and 11 per cent. with no relief or recurrence of symptoms. He described the modifications required in cases of unusual difficulty, and gave a special warning against reoperation for gastritis following gastrectomy. This, he said, could never be successful.

THE ANTI-JERRY-BUILDERS

THE Housing Improvement Association held a luncheon at the Langham Hotel on Jan. 14th at which the Minister of Health was present and spoke on a scheme for improving the standards of house building. The scheme, which is to be administered by the National House-Builders' Registration Council includes the registration of house-builders and the certification of houses built according to their specification. The council is made up of representatives of building societies, building trades' employers and operatives, architects, and we learn that Dr. J. Greenwood Wilson, medical officer of health for Cardiff, has been invited to serve upon it. While all who are working for an improvement in housing standards will welcome the proposed specification and the certification, the Association will not rid us of the unscrupulous builder who does not join it and who will flourish as long as the State allows him to deliver his wares and the public is unwise enough to buy them. But some good will certainly come out of this movement in standardising and raising the level of work amongst builders of mass-produced, low-priced properties, for which there is a big demand, by reduction of competition through a standard specification. This should react upon the public demand for soundness rather than show, and promote the popularity of the certificate. We can only trust that those who advance money for house purchase will insist upon the certificate.

THE BATTERSEA STORM

As we related on Jan. 9th, the honorary appointments at Battersea General Hospital (formerly the Antivivisection Hospital) were recently thrown open to public competition. An independent selection committee nominated a new staff, omitting many of the former members. At the last moment the hospital board refused to accept the selection committee's recommendations in toto, and the chairman (Mr. Parkes) resigned in protest, with two of his colleagues. The remaining members of the board, who are carrying on the management of the hospital, have now reappointed all those members of the staff whose applications were disapproved by the selection committee. In a letter to the press, however, Lord Ernest Hamilton (chairman before June, 1935) and Sir Herbert Lush-Wilson say that "the board has come to the sad conclusion that unless a sum approaching £40,000 can be obtained we should not be justified in carrying on the hospital beyond another month."

GREASY LENSES

A CORRESPONDENT writes: "For some time past I have possessed a stick of 'jeweller's rouge' which was presented to me. Having tried it on various metals and glass I have discovered that if a small piece of washleather is rubbed with the stick of rouge it makes an excellent wiper for dirty or greasy spectacle lenses, and one which can quite easily be kept in the spectacle case. The colour of this kind of rouge is due to the ferric oxide (Fe_2O_3), obtained by calcinating sulphate of iron, which gives it its cleansing properties, and not to the addition of carthamin, cochineal, or other pigment as is the case with cosmetic rouge."

NEW PREPARATIONS

"TABLOID" CALCIUM GLUCONATE AND IRON (Effervescent) is issued by Burroughs Wellcome and Co., Snow Hill Buildings, London, E.C.1. One tabloid dissolved in a tumblerful of water makes an effervescent draught containing 20 grains of calcium gluconate and 3 grains of iron and ammonium citrate. The preparation is recommended for adults or children who may be suffering from a deficiency of calcium and iron, and especially for women during pregnancy and lactation.

BENERVA BRAND VITAMIN B_1.—On March 28th last we reviewed a paper in which W. Ritchie Russell described his use of vitamin B_1, given by injection, in the treatment of polyneuritis and other nervous diseases (see *Edinb. med. J.*, 1936, **43**, 315). The preparation employed has now been put on the market by Roche Products, Ltd. (51, Bowes-road, N.13), under the name of Benerva. Each ampoule of 1·0 c.cm. is stated to be equivalent to 500 international units of the vitamin, and the dose may be either hypodermic or intramuscular. Success has been claimed in treating various forms of polyneuritis, subacute combined degeneration of the cord, anorexia nervosa, and neuritis in pregnancy. The manufacturers also mention many other diseases and disorders in which they have reason to think vitamin B_1 useful.

SALICYLYSIN LINIMENT and OINTMENT contain 20 per cent. of glycol iodosalicylic ester, a new organic compound of iodine and salicylic acid in readily absorbable bases. The makers (Allen and Hanburys Ltd., Bethnal Green, E.2) say that they are non-irritant, non-staining, and practically odourless, and recommend them for fibrositis, subacute or chronic articular rheumatism, arthritis, sprains, sciatica, and other forms of neuritis.

GABASOL is a germicide said to have a Rideal-Walker coefficient of 4·5 when tested against carbolic acid, using *Bacillus typhosus* (Lister strain). The advantages claimed for it include a low surface tension, giving great penetrating power, and a nearly neutral reaction; "it is non-toxic, non-poisonous, non-staining, and has a pleasing and refreshing odour . . . it promotes rapid healing without any trace of irritation or redness." The manufacturers are Gale, Baiss and Co., Ltd., Canterbury-road, S.E.15.

VITA LIVE NATURAL GRAPE JUICE.—This is a bottled grape juice (non-alcoholic) concentrated by a low-temperature process so that it retains its ferments and vitamins. The only change, it is claimed, is that about five-sixths of the water is removed; and the large bottles are described as containing the equivalent of 17½ lb. of fresh grapes. The high content of grape sugar (glucose) ensures that the juice will keep indefinitely and gives it a high calorie value (1600 per pint). According to the manufacturers (Vita Products, Ltd., 39, Finsbury-square, E.C.2) it is rich in iron in easily assimilable form and has a gentle laxative and diuretic action; they put it forward as a natural fruit juice for children—supplying them with vitamins A and B—as a tonic and "energiser," as a flavouring, and as a beverage. Diluted with water or soda-water it makes a very pleasant drink.

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., £150.
Bangor, Caernarvonshire and Anglesey Infirmary.—Hon. Gynæcologist.
Battersea General Hosp., Battersea Park, S.W.—H.P., at rate of £120.
Bedfordshire County Council.—Asst. County M.O.H., &c, £800.
Birmingham and Midland Hosp. for Women.—H.S., at rate of £100.
Blackburn, Brockhall (Certified Institution for Mental Defectives), Langho.—Asst. M.O., £500.
Blackburn, Calderstones Certified Institution for Mental Defectives, Whalley.—Med. Supt., £950.
Bootle County Borough.—Asst. M.O.H. and Asst. School M.O., £500.
Bradford Royal Infirmary.—Res. Surg. O., £250.
Bristol City and County.—Asst. M.O.H., £500.
Cardiff Royal Infirmary.—Radium Registrar, at rate of £200.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Third Res. H.S., at rate of £75.
Chester, County Mental Hosp.—Deputy Med. Supt. £675.
Chesterfield and North Derbyshire Royal Hosp.—H.S. to Ophth. and Ear, Nose, and Throat Depts., at rate of £150.
Croydon County Borough.—Asst. M.O.H. and Asst. School M.O., £500.
Derby, Derbyshire Royal Infirmary.—Gynæcological H.S. and Emergency Anæsthetist, £150.
Eastbourne, Royal Eye Hosp., Pevensey-road.—H.S., £100.
East Ham Memorial Hosp., Shrewsbury-road, E.—H.P., at rate of £150.
Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—Asst. Radiologist, £100.
Folkestone, Royal Victoria Hosp.—Jun. Res. M.O., at rate of £120.
General Lying-in Hosp., York-road, Lambeth, S.E.—Jun. Res. M.O. and Anæsthetist, at rate of £100.
Gloucester, Barnwood House Registered Mental Hosp.—Med. Supt. £1500.
Gloucester County Council.—County M.O.H. and School M.O. £1200.
Grimsby and District Hosp.—Surgeon for Orthopædic Dept., and Fracture Clinic, £350.
Guildford, Royal Surrey County Hosp.—H.S., at rate of £150.
Hertford, Ware Park Sanatorium.—Asst. M.O., £300.
Hosp. of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Clin. Asst. in X Ray Dept., £75.
Kendal, Westmoreland County Hosp.—H.S., at rate of £200.
Kenya, Mathari Mental Hosp., Nairobi.—Res. Physician, £810.
Lancaster, Royal Albert Institution for the Feeble Minded.—Res. Asst. M.O., £375.
Leeds General Infirmary.—Hon. Aural Surgeon.
Leeds Public Dispensary and Hosp.—Sen. Res. M.O., £200.
Liverpool City.—Res. Asst. M.O.'s, each £200.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Sen. and Jun. Assts., £325 and £225 respectively.
London County Council.—Asst. M.O.'s, Grade 1, £350.
London Jewish Hosp., Stepney Green, E.—Hon. Surgeon.
Maidstone, Kent County Ophthalmic Hosp.—H.S. to Ear, Nose, and Throat Dept., at rate of £250.
Maidstone, West Kent General Hospital.—H.S., £175.
Marie Curie Hosp., Fitzjohn's-avenue, N.W.—Asst. Director.
Metropolitan Hosp., E.—Psychiatrist.
Middlesex Hosp., W.—Res. M.O., £400.
Newcastle-upon-Tyne, Barrasford Sanatorium.—Res. Med. Asst., £250.
Newcastle-upon-Tyne Hosp. for Sick Children.—Sen. Res. M.O., £250. Also H.P. and H.S., each at rate of £100.
Newcastle-on-Tyne, Wooley Sanatorium, near Hexham.—Asst. M.O., £350.
Newport County Borough.—Asst. M.O.H., £500.
Nottingham General Hosp.—H.S. for Fracture and Orthopædic Depts., £300.
Oxford, Wingfield-Morris Orthopædic Hosp., Headington.—Res. H.S., £100.
Pendlebury, Royal Manchester Children's Hosp.—Asst. M.O. for Out-patients' Dept., at rate of £150.
Peppard Common, Oxon, Berks and Bucks Joint Sanatorium.—H.P., £250.
Preston, Sharoe Green Hosp.—Jun. Asst. Res. M.O., at rate of £100.
Princess Elizabeth of York Hosp. for Children, Shadwell, E.—Asst. Surg.
Queen's Hosp. for Children, Hackney-road, E.—Cas. O. At rate of £100.
Royal Chest Hosp., City-road, E.C.—Clin. Assts.
Royal Free Hosp., Gray's Inn-road, W.C.—Hon. Asst. Physician.
St. Albans and Mid Herts Hosp., Church-crescent.—Res. H.S., £150.
St. John Clinic and Institute of Physical Medicine, Ranelagh-road, S.W.—Hon. Cons. Surgeon. Also Clin. Asst. to Orthopædic Surgeon.
Sheffield Royal Infirmary.—Clin. Asst. to Surg. Dept., at rate of £300.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Two Hon. Registrars.
Surrey County Council.—Asst. M.O., £600.
Swansea, Hill House Infectious Diseases Hosp.—Res. M.O., £350.
Walsall General Hosp.—H.S., at rate of £150.
Westminster Hospital, Broad Sanctuary, S.W.—Hon. Clin. Asst. to Gynæcological Dept.
Woolwich and District War Memorial Hosp., Shooters Hill, S.E.—Res. M.O., £175.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Auchtermuchty (Fife), Uffculme (Devon), Louth (Lincs), and Staindrop (Durham).

SHEFFIELD ROYAL HOSPITAL.—Two extra storeys are being added to the new miners' welfare block which is being built at this hospital. In one of these there will be accommodation for paying patients. The sum of £4000 has been contributed towards providing this accommodation.